



TYPICAL EARLY NAZCA COLORING (171217)

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PART III

TEXTILES OF THE EARLY NAZCA PERIOD

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36 Plates, 2 Colored Plates, 1 Text Figure

SECOND MARSHALL FIELD ARCHAEOLOGICAL EXPEDITION TO PERU

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CONTENTS

	PAGE
List of Illustrations	121
Preface	127
Introduction	131
Garment Types	133
Early Nazca Colors	136
Seven Major Color Groups	146
Red-to-Orange Color Group	146
Orange-to-Yellow Color Group	148
Yellow-to-Green Color Group	148
Green-to-Blue-Green Color Group	149
Blue-Green-to-Blue Color Group	150
Blue-to-Red Color Group	150
Purple-to-Red Color Group	151
Early Nazca Yarns	153
Early Nazca Mantles	154
Mantle Dimensions	155
Mantle Warp-weft Yarn Counts	156
Correlation between Mantle Types and Warp-weft Counts	157
Mantle Yarns	158
Plain Weave Undecorated Mantles	159
Plain Weave Unidentifiable Garment Materials	159
Plain Weave Striped Mantles	160
Striped Cotton Mantles	160
Striped Wool Mantles	161
Striped Mantle Colors	164
Brocaded and Embroidered Mantles	164
Mantles with Needleknitted Edges	172
Unidentifiable Fragments	174
Colors in Needleknitting Specimens	175
Pattern Weave Mantles	178
Gauze Weave Mantles	179
Miscellaneous Mantle Types	180
Interlocking Warps and Wefts	180
Early Nazca Tunics	183
Early Nazca Kerchiefs and Veils	187
Early Nazca Aprons	191
The Miscellaneous Group	192
Bands	192
Woven Bands	193
Plaited Bands and Cords	195
Warp-twined Fabrications	196
Embroidered Bands and Garment Fragments	198
Cords	200
Slings	201
Netting	202

	PAGE
Feather Bands	202
Wrappings	202
Pads	203
Stone Wound with String	203
Summary	204
Garments	204
Textures	204
Decorative Features	204
Colors	205
Yarns and Technical Processes	205
Yarns	205
Warp-weft Techniques	205
Single-element Techniques	206
Superstructural Techniques	207
Stitchery	207
Devices to Vary Effect	207
Single-element Manipulation	208
Conclusions	213
Glossary	215

LIST OF ILLUSTRATIONS

Specimens designated by numbers containing six figures are in Field Museum of Natural History; those of four figures are in the University of California Museum of Anthropology.

The several sites at a locality in the Nazca Valley are distinguished by capital letters; subsites or portions of a cemetery by small letters following; graves by numbers. Thus, "Cahuachi, Aj10-171218a" means part or fragment *a* of Field Museum specimen 171218 which was found in grave 10 of portion *j* of cemetery (site) A at Cahuachi, valley of Nazca. Superior numbers indicate addition to the original list (see explanation, page 131).

All Field Museum specimens were excavated or found by A. L. Kroeber in 1925 and 1926; the California specimens were secured by Max Uhle in 1905. These latter (4), marked by an asterisk, are surface finds lacking precise provenience.

Arrows by the specimen numbers on the plates denote the direction of the warp.

PLATES

- XXXII. Typical Early Nazca Coloring; 171217 (in color).
- XXXIII. Typical Early Nazca Brocade and Embroidery; 171218a (in color).
- XXXIV. Early Nazca Period Garments. *a*, Cahuachi; Ha-171181; apron, 37½" x 16½"; plain weave, needleknitted bindings on string ends. *b*, Cahuachi; Aj13-171262; diagram of mantle showing characteristic treatment of edges: side trimmings continued part way across ends. *c*, Cahuachi; Aj13-171266b; child's tunic with embroidered bands (Plate LVIIa, *b*, *c*). *d*, Cantayo; C-ax cache-171071d; child's tunic with Kelim slit for neck opening. *e*, Cahuachi; A15-171308; tunic with checkerboard section in two colors; interlocking warps and wefts (Plate LXVIIg).
- XXXV. Pads and a Headband(?). Cahuachi. *a*, Aj13-171280; girdle(?) or headband(?), 2½" wide; plain weave, warp stripe (Plate XXXVIIId). *b*, *c*, Aj11-171236; surface and reverse sides of pad stuffed with cotton, 8½" x 5½"; single-face pattern weave, warp and weft floats (Plate XLVIId, *e*, *f*). *d*, Ag-171330; pad stuffed with cotton, 10" x 6", approximately.
- XXXVI. Striped Cotton Materials. *a*, *b*, *c*, Cahuachi; Ha-171183; A14-171305b; A15-171311. *d*, *e*, Majoro; A6-170465b, *d*; schematic representations of colored yarns in warp set-ups for cotton striped materials.
- XXXVII. Striped Wool Materials. *a*, Cantayo; C-ax cache-171071a¹. *b*, Majoro; A6-170462b. *c*, *d*, *e*, *f*, Cahuachi; 170211c¹⁻²; Aj13-171280; Aj13-171265; Aj13-171262. *g*, Cantayo; C-ax 11-171033. *h*, Cahuachi; A15-171310. *i*, Ocongalla West; 6-170665; schematic representations of colored yarns in warp set-ups for wool materials. *j*, Cahuachi; A14-171305c; flat-view diagram of colored weft stripes.
- XXXVIII. Variations in Tapestry Technique. *a*, Cahuachi; Aj10-171225; band for kerchief, 1½" wide; Kelim tapestry woven on wefts which cross a space provided for in the warp set-up (Plate LXVIIIId). *b*, Majoro; A6-170465e; band, ½" wide; Kelim and eccentric tapestry weaving. *c*, *d*, Cahuachi; Aj10-171217a; detail of lower tunic edge showing twining wefts, and figure-8 tapestry weaving on warp loops; fringed band sewn to tunic armscy, 9" overall; Kelim and eccentric tapestry weaving, separately woven and applied fringe.
- XXXIX. Interlocking in Plain Weaves. Cahuachi. *a*, *c*, Ag-171111; diagram of multicolored "patchwork" with stepped fret motives, 5" long, and reconstruction showing method of making (*a*). *b*, *d*, Aj10-171221; diagram of mantle motive, 15" long; plain weave, interlocking wefts as shown in detail reconstruction (*b*).

- XL. Woven Bands and Cords. Cahuachi. *a*, Ag-171118f²; turban band, $\frac{1}{4}$ " wide; plain weave with double weft. *b*, Ag10-171227; turban band, $\frac{1}{4}$ " wide; plain weave. *c*, *f*, Ag-171109a¹; turban band, $\frac{1}{4}$ " wide, and detail showing plain weave variation on two warps. *d*, *e*, Ha-171180c; tubular cord, $\frac{3}{8}$ " wide, approximately; single-face pattern weave, underfloat warps.
- XLI. Gauze Weaves. *a*, *c*, Cahuachi; Ag-171110; gauze weave motives within a plain weave cotton fabric, $5\frac{1}{2}$ " long; detail showing manipulation of warps in change from plain to gauze weave with return to original position on the sixth pick of weft. *b*, Majoro; A7-170476f¹; mantle fragment with attached band, $1\frac{1}{2}$ " wide; plain weave with gauze motives and applied plaits; band in double-face pattern weave, warp floats.
- XLII. Plaited Bands and Cords. *a*, *f*, *g*, Majoro; A7-170476d; fragment of double-cloth band, $2\frac{1}{2}$ " wide, with three 16-strand twine plaited ends (*g*) coming together as a 48-strand flat plait, $\frac{3}{8}$ " wide (*f*). *b*, Majoro; A7-170476f¹; 4-strand flat plait. *c*, *d*, Cahuachi; Ea-171124b¹, c¹; 4-strand round plait, and 7-strand flat plait. *e*, *h*, Cahuachi; 170211d⁶; Ag-171118f²; 8-strand and 9-strand flat plaits. Plaits *b*, *c*, *d*, *e*, *h*, $\frac{1}{8}$ " wide, approximately.
- XLIII. Pattern-weave Borders. *a*, *c*, Cantayo; C-ax 171059; flat-view diagram and design of wool kerchief band, 1" wide; single-face pattern weave, warp underfloats. *b*, Cahuachi; Ag-171119; border design, $\frac{1}{2}$ " wide; double-face pattern weave, weft floats (Plate XLVc). *d*, Cahuachi; Ag-171118e; design of wool kerchief band, $1\frac{1}{4}$ " wide; single-face pattern weave, warp underfloats (Plate XLVa, *b*). *e*, Cahuachi; Aj10-171226; design of wool kerchief band, $1\frac{5}{8}$ " wide; single-face pattern weave, warp underfloats (Plate XLIVb).
- XLIV. Flat Views of Pattern Weaves. Cahuachi. *a*, Aj13-171279a; mantle material, crosses $\frac{3}{4}$ ", approximately; single-face pattern weave, warp and weft underfloats. *b*, Aj10-171226; flat-view diagram of wool kerchief band, $1\frac{5}{8}$ " wide; single-face pattern weave, warp underfloats (Plate XLIIIe).
- XLV. Flat Views of Pattern Weaves. Cahuachi. *a*, *b*, Ag-171118e; flat-view diagrams of surface and reverse sides of wool kerchief band, $1\frac{1}{4}$ " wide; single-face pattern weave, warp underfloats (Plate XLIII d). *c*, Ag-171119; flat-view diagram of mantle border, $\frac{1}{2}$ " wide; double-face pattern weave, weft floats (Plate XLIII b). *d*, Aj10-171220; flat-view diagram of mantle border, $\frac{1}{2}$ " wide; embroidery similar to brocade done on loom.
- XLVI. Flat Views of Pattern Weaves. Cahuachi. *a*, *b*, *c*, Aj13-171279b; flat-view diagrams of surface and reverse sides of pad material, design unit, $\frac{1}{4}$ " long; single-face pattern weave, warp and weft floats. *d*, *e*, *f*, Aj11-171236; flat-view diagrams of surface and reverse sides of pad material, cross motive, $\frac{3}{4}$ " wide; single-face pattern weave, warp and weft floats (Plate XXXVb, *c*).
- XLVII. Flat View of a Pattern Weave. Cahuachi. Aj10-171218b; schematic representation of mantle material in six colors; single-face pattern weave, warp and weft floats.
- XLVIII. Slings and Sling Details. Cahuachi. *a*, *b*, *c*, Aj13-171289a; complete sling as found, center 7" long; reconstructions of 4-strand round-plait "handle" (*b*), and one of two center plaits (*c*). *d*, A15-171314; fragments of sling, 1" wide at center; Kelim tapestry and wrapped weaves.
- XLIX. Reconstructed Mantle 171220. Cahuachi. Aj10-171218a, 171219a, 171220; diagram showing arrangement of fragments of cotton mantle, originally 6' 8" (?) x 5' 5"; brocade and embroidery in wool yarns.
- L. Brocaded Motives in Mantle 171220. Cahuachi. *a*, Aj10-171218a, 171219a¹, 171220; motive H, $5\frac{1}{4}$ " x $14\frac{1}{4}$ ". *b*, Aj10-171218a, 171219a¹; motive G, $3\frac{3}{4}$ " x $14\frac{1}{2}$ "; both in brocade technique.

- LI. Border Motives in Mantle 171220. Cahuachi. *a*, Aj10-171219a¹; end border D, 2" x 9½" overall. *b*, Aj10-171219a²; end border C, 1½" x 12" overall. *c*, Aj10-171218a; end border E, 3½" x 12" overall; all in brocade technique.
- LII. Border Motives in Mantle 171220. Cahuachi. *a*, Aj10-171219a¹; end motive F, 1½" x 2½". *b*, Aj10-171220; fragmentary center motive J, 1" x 2". *c*, Aj10-171218a, 171219a¹. *d*, Aj10-171219a², 171220; side border A, 1" wide. *e*, Aj10-171219a³; end border C¹, 1½" x 7" overall; side borders embroidered, others in brocade technique.
- LIII. Twine-plaited Bands. Majoro. *a*, A7-170476e; band, ¾" wide, in two colors; twine-plaiting technique. *b*, A7-170476c; band, ¾" wide, in three colors; twine-plaiting technique.
- LIV. Twined "Lace." Cacatilla. *8537; "lace"; square motives, 1¾", approximately; twine-plaiting technique.
- LV. Embroidered Kerchiefs. *a*, "Nazca"; *9120; allover cross design in kerchief, 11½" x 13½"; double running stitch embroidery (Plate LX*i*). *b*, Cantayo; C-ax 171045; allover stepped-fret design, 2" to 4" long, on kerchief with scalloped edges (Plate LXV*e*, *f*); stem stitch embroidery.
- LVI. Embroidered Tunic Bands. Cahuachi. Aj13-171266b; wool embroidery on child's cotton tunic (Plate XXXIV*c*). *a*, Separately woven band with Kelim neck opening, 18" x 1½". *b*, Sleeve band. *c*, Detail of patterning across shoulders, sleeve band, and separately woven fringe; stem stitch embroidery.
- LVII. Embroidered Bands. *a*, Cahuachi; G-171140a, *b*, *c*; cotton and wool bands, 2½" wide; stem stitch embroidery in wool yarn. *b*, Cantayo; C-ax 171049; cotton band, 1½" wide; stem stitch embroidery in wool yarn. *c*, Cahuachi; Ha-171180d; wool band, 3½" wide overall; weaving, stitchery, and fringe techniques. *d*, Cantayo; C-ax 171050; cotton band, ¾" wide; stem stitch embroidery in wool yarn. *e*, Majoro; A6-170465a; design on corner of cotton mantle, figures 1" long; embroidery in stem and running stitches.
- LVIII. Embroidered Motives on Mantle 171216. Cahuachi. *a*, *b*, *c*, *d*, Aj10-171216; motives embroidered in corners of cotton mantle, figures 4½" high, approximately; double running stitches (Plate LX*h* shows detail of staves in hands of figures *a* and *b*).
- LIX. Embroidered Mantle 171222. Cahuachi. *a*, Aj10-171222; single web mantle with maintained color sequence in flower motives, 50" x 41½"; embroidery. *b*, Detail of petal in tent stitches.
- LX. Embroidery Techniques. *a*, Cahuachi; Aj13-171266b; blanket stitches reinforcing neck opening. *b*, Cahuachi; Aj10-171217a; twining stitches (Plate XXXVIII*c*). *c*, Cahuachi; Aj13-171266a; motive ¾" long; double running stitches. *d*, *e*, *f*, *g*, Stem stitch variations as found in several specimens. *h*, Cahuachi; Aj10-171216; detail of men motives shown in Plate LVIII*a*, *b*; double running stitches. *i*, "Nazca"; *9120, kerchief motive, 1" to 1¼" long; double running stitches (Plate LV*a*).
- LXI. Needleknitted Bands and Fringes. *a*, *b*, *c*, Cahuachi; Aj10-171224; surface side, profile, and reverse side of mantle trimming band, 2" wide; weaving and needleknitting techniques. *d*, Cahuachi; A15-171309; flat tape veneered with needleknitting, tabbed and fringed edges, 3" overall. *e*, Cantayo; C-ax cache-171071d; design in needleknitted neck binding (Plate XXXIV*d*). *f*, Cahuachi; Ag-171112; needleknitted bird-flower fringe showing color areas, 2½" overall. *g*, Cahuachi; Ag-171117; fringed band veneered with needleknitting, 1¾" wide. *h*, *i*, *j*, Cahuachi; A15-171321b¹⁻², Ag-171115; heads veneered with needleknitting, 1¾" square approximately.
- LXII. Needleknitted Bands and Fringes. *a*, Cahuachi; Aj10-171223a; mantle corner showing needleknitted bird fringe, ¾" wide. *b*, Trancas; *9058, needleknitted bird-flower fringe, 2" high. *c*, *d*, Cantayo; C-ax cache-171071b; separately woven neck trimming veneered with needleknitting, 14½" x 15½"; and enlarged detail of motives at one end.

- e*, Cahuachi; Ag-171114; flower detail, needleknitted, 2" high. *f, g, h*, Cahuachi; 170211b, Ha-171180b¹, A15-171321a; tabbed bands veneered with needleknitting, 1½" wide, approximately, characteristic bird motives.
- LXIII. Needleknitting Techniques. *a, b*, Surface and reverse sides of 1-loop and 2-loop needleknitting. *c*, Cantayo; C-ax cache-171071d; surface and reverse sides of 5-loop needleknitted neck facing, patterned, ¼" wide (Plate LXIe). *d*, Cahuachi; Aj13-171267b; 5-loop needleknitted binding. *e*, Cahuachi; G-171140b; 3-loop needleknitted binding. *f, g*, Cahuachi; Ag-171112; reconstructed foundation and needleknitted veneer for birds' tails; reconstructed foundation in buttonhole stitches for birds' heads (Plate LXIf).
- LXIV. Edge Cords, Tabbed and Fringed. *a*, Cahuachi; Aj13-171265; mantle edge cord, tabbed and fringed, ⅜" wide; combination of needleknitting, buttonholing, and figure-8 tapestry techniques (Plate LXVd). *b*, Cahuachi; Aj13-171265; mantle tape-fringe, ⅜" wide; plain weaving on three warps, the outer one subsequently removed. *c*, Cantayo; C-ax 11-171033; embroidered band, tabbed and fringed, ½" wide; combination of weaving and stitchery techniques. *d, e*, Cahuachi; Aj13-171262, Ea-171125; mantle edge cords, tabbed and fringed, ¾" wide; combination of needleknitting, buttonholing, and weaving techniques.
- LXV. Miscellaneous Techniques. *a*, Cahuachi; Ha-171180d; tab, ⅝" long; buttonhole stitches (Plate LVIIc). *b*, Cahuachi; G-171140b¹⁻²; woven tabs, 2", approximately; plain weave on basic warps or on wefts extended to scaffolding yarns. *c*, Majoro; A7-170476f²; cord, ⅛" diameter; 4-loop needleknitting. *d*, Cahuachi; Aj13-171265, detail of tab technique (Plate LXIVa). *e, f*, Cantayo; C-ax 171045; ¼" scallop on kerchief edge (Plate LVb), and detail of technique. *g, h*, Cahuachi; Ag-171118g, h; netting, ½" mesh; half-hitching and fingerknot techniques.
- LXVI. Fringe Techniques. *a*, Cahuachi; Aj13-171266b; lower edge fringe of unwoven warp lengths showing removable scaffold weft, 6" deep. *b*, Cantayo; C-ax cache-171071c; feather band, 1" deep, prepared for applying to woven material. *c*, Cantayo; C-ax cache-171071d; fringe 1" deep around tunic edges; needlemade. *d*, Cahuachi; A15-171308; reconstruction of fringe 7" deep on armseye bands; regular weft carried to skeleton warp subsequently removed.
- LXVII. Seaming Stitchery Techniques. *a, e*, Cahuachi; A15-171308; methods of reinforcing underarm seams at lower ends of armseyes. *b, c*, Cahuachi; Aj10-171217a, A15-171310; zigzag and saddler's seaming stitches. *d*, Ocongalla West B; 1-170677b; "sham" hemstitch seam. *f*, Cahuachi; Aj10-171214; "loom join" (?), or lacing stitches. *g*, Cahuachi; A15-171308; reconstructed detail of warp locking, end-to-end, on skeleton weft (Plate XXXIVe). *h*, Cahuachi; Aj13-171266b; hemming stitches. *i*, Majoro; A6-170465c; running stitch seam. *j*, Majoro; A6-170462b; whipping stitches.
- LXVIII. Weaving and Stitchery Devices. *a*, Cahuachi; A15-171308; detail of ½" Kelim tapestry band at bottom of tunic showing twining yarns, and fastening by plaiting and twisting together ends (Plate XXXIVe). *b*, Cahuachi; 170211h; detail showing warps at edge deliberately(?) close set for selvage. *c*, Cahuachi; Ag-171119; detail showing warp crossing against slip and warp grouping for tapestry weaving in mantle border. *d*, Cahuachi; Aj10-171225; reconstruction showing weft-to-warp change for Kelim tapestry weaving (Plate XXXVIIIa). *e, f*, Cahuachi; Aj10-171218a, 171219a¹; detail of side border of mantle, and reverse side (*e*) showing interlocking of embroidery yarns at color change (Plate LIIc). *g*, Cantayo; C-ax cache-171071d; method of making neck opening in Kelim tapestry technique.

TEXT FIGURE

PAGE

Painting on cloth in style of pottery decoration. The earliest known Peruvian painted fabric 135

ILLUSTRATIONS IN THE PRELIMINARY REPORT

The following Early Nazca specimens are illustrated in the Preliminary Report: University of California Publications in American Archaeology and Ethnology, vol. 28, No. 2, pp. 23-56, Berkeley, 1930.

Cacatilla; *8537; Plate 7*a*. Trancas; *9056; Plate 7*b*. Trancas; *9058; Plate 3*a*. Cahuachi; 170211*e*; Plate 6*a*. Cantayo; C-ax 11-171033; Plate 8*b*. Cantayo; C-ax 171045; Plate 8*c*. Cantayo; C-ax 171049; Fig. 3. Cantayo; C-ax cache-171071*b*; Fig 7. Cantayo; C-ax cache-171071*d*; Plate 8*a*. Cahuachi; Ag-171110; Plate 4*a*, Fig. 1. Cahuachi; Ag-171111; Figs. 8, 9. Cahuachi; Ag-171112; Plate 3*c*. Cahuachi; Ag-171113; Plate 3*b*. Cahuachi; Ag-171114; Plate 3*b*. Cahuachi; G-171140*a, b, c*; Fig. 2. Cahuachi; Ha-171180*a*; Plate 3*b*. Cahuachi; Aj10-171216; Fig. 6. Cahuachi; Aj10-171218*a*; Plate 1*a-c*. Cahuachi; Aj10-171221; Fig. 4. Cahuachi; Aj10-171222; Fig. 5. Cahuachi; Aj10-171226; Plate 2*a, b*. Cahuachi; Aj11-171236; Plate 4*b*. Cahuachi; Aj13-171262; Plate 5. Cahuachi; Aj13-171266*b*; Plate 2*b*. Cahuachi; A15-171308; Fig. 10.

PREFACE

Dr. O'Neale's monograph on the Early Nazca textiles represents a first installment of the delayed report on my findings in 1926 as leader of the Second Marshall Field Expedition to Peru for Field Museum of Natural History.

In 1925 I visited Peru for Field Museum. Excavations were conducted chiefly in Lima and Cañete valleys, but I also made reconnaissances to Trujillo in the north and as far south as Nazca. The latter trip indicated Paracas and Nazca as strategic points of attack: the former because it bore evidences of an unknown culture, the latter because the several cultures already known from the Nazca region presented a problem of several cultures whose sequence had not been definitely determined.

Before my return in 1926 in company with Mr. W. E. Schenck,¹ on a second expedition for Field Museum, Dr. J. C. Tello had excavated extensively on Paracas peninsula and discovered there two related cultures of fundamental importance. The 1926 expedition accordingly centered its operations in the Nazca area, and for something over three months operated with a considerable crew from a base camp at the edge of the desert, some miles outside the town of Nazca. For part of this period Dr. Tello, as representative of the Peruvian government, was in residence with us. The daily association and resulting cooperation proved extremely stimulating and productive scientifically. After conclusion of the systematic excavations at Nazca, I spent a month, again partly accompanied by Dr. Tello, in the northern coast region, reconnoitering from the river Viru to the river Leche. The results of this trip, as well as of my first year's briefer northern reconnaissance, have been published in Nos. 1 and 2 of this volume.

One fact or another has prevented the preparation of a full report on my major explorations in Peru: above all, the circumstance that the collections were in Chicago, whereas my work kept me at the University of California. A report on Cañete has, however, now been published, and I hope to be able before long to follow this with a report on the results of the expedition to Nazca, other than the textile remains which Dr. O'Neale has here analyzed and presented with such exceptional competence.

Dr. O'Neale, who is Associate Professor of Household Art and Associate Curator of Textiles in the Museum of Anthropology at the University of California, became interested in Peruvian textiles about the time of my return from Peru. The result was a general preliminary paper, published by the University of California under our joint authorship in 1930.² The thorough technological analyses upon which this paper rests are wholly the work of Dr. O'Neale. My contribution is limited to questions of period and relative chronology. This report was based in part on the collections made for the University of California by Dr. Max Uhle many years ago, in part on material which I had secured for Field Museum.

The present monograph treats exhaustively the Early period textiles of the Nazca or Rio Grande drainage, and is based primarily on the Field Museum collections, the majority of which have a known provenience as to site, sub-site, and tomb, and therefore possess known relations to types of pottery and other artifacts. The Uhle collections from Nazca, now in California, for the most part lack such associated data, having been collected in a reconnaissance expedition, in fact, on the first known trip of any archaeologist to Nazca.

¹ Formerly Assistant Curator of Archaeology in Anthropological Museum, University of California, and expedition assistant in 1926.

² Textile Periods in Ancient Peru, Univ. Calif. Publ. Amer. Arch. Ethn., vol. 28, pp. 23-56, 1930.

Some of the Uhle specimens, however, have been included in the discussion on account of their intrinsic or technological significance.

Dr. O'Neale is especially equipped for this undertaking, not only as the result of many years spent in the examination and analysis of ancient Peruvian textiles now reposing in North American museums, but because she spent the year 1931-32 in Peru as Guggenheim Fellow, pursuing studies on the abundant textile material in the collections in that country.

It should be added that, contrary to prevailing opinion, the textile art of the Early Nazca culture has hitherto been known very inadequately, and has in fact scarcely been defined and recognized. When some thirty years ago the first finely embroidered polychrome shawls and garments from this part of Peru became known in America and Europe, they were attributed to the valley of Ica, which is reached from the port of Pisco. Seler and Crawford, for instance, attribute characteristic show-pieces of this type to Ica. Later, when Uhle discovered that the hearth of the early culture in this area lay around Nazca rather than in Ica, the same type of fabrics became known as Nazca textiles. This was natural because the embroidery design styles showed close relationship to the pottery design styles which by then had become well authenticated as characteristic of Nazca. However, Dr. Tello's extraordinary discoveries at Paracas definitely confirmed a suspicion, which he had harbored for some years, that the source of these sumptuous embroideries and associated textiles was neither Ica nor Nazca, but the peninsula of Paracas, much closer to the coast and only a few miles from the harbor of Pisco. Since then, the name of Paracas has properly become associated with this type of textiles.

The stylistic relation between Early Nazca pottery designs and Paracas textile designs is so close as to leave little doubt of a common origin; that is to say, of a transfer of the designs from one medium to the other. Dr. Tello, impressed with the antiquity of Paracas, seems inclined to consider the Paracas textiles the earlier. In common with most archaeologists I hold it to be more likely that the Nazca pottery is the earlier, because naturalistic or seminaturalistic representations containing curved lines involve no difficult technique in pottery painting, but do involve a high and special technical development in textile ornamentation. Were the question one of geometric patterns, the answer might well be the reverse.

The situation contains one remarkable feature. The Paracas textile representations of demons or human beings do not find their counterpart in Paracas pottery, and, vice versa, the corresponding pottery representations at Nazca have only a rudimentary counterpart in the textiles of the Nazca culture. The Early Nazca textile art which I discovered in association with typical Early Nazca pottery is largely decorative and tends to the geometric. Its representative or naturalistic impulses are relatively undeveloped. This is abundantly manifest in Dr. O'Neale's design illustrations. The Paracas and Nazca textile techniques are closely similar, but in general stylistic tendency Nazca pottery and Paracas fabrics go together; and Nazca fabrics and Paracas pottery vessels are alike at least in not seriously attempting naturalistic representation. The cause of this peculiar relation is unknown, but the fact is now indubitable. The reason it had not been recognized previously is that the great mass of Peruvian collections which have found their way into museums were gathered commercially, and therefore have remained unaccompanied by data as to their associations. In the case of the Nazca area, the lack of such data was particularly unfortunate because this area witnessed a long, continuous occupation by a series of peoples or cultures. At least three fundamental types of culture are represented in the remains; and, if variants of these be included, not less than six or seven periods must be recognized. On account of

their greater age, the Early Nazca textiles are least frequently preserved. In fact, I had little success in discovering them except in the lower and sandier reaches of the valley. The majority of fabrics secured from about Nazca are of Middle and Late times of Peruvian prehistory, and are as thoroughly different from the Early textiles as the Middle and Late pottery of the valley is from the Early pottery.

The one painted piece of cloth shown (Text Fig., p. 135) is of interest because it duplicates in its design a well-known type of Early Nazca pottery vessel, in fact, a type characteristic of what I have called the A phase of Early Nazca, and which I believe, in common with most Peruvianists, to be the oldest phase of this culture. The birds, their attitudes, and their placement in the design, on this piece of cloth, are as good as identical with the corresponding birds painted on Early Nazca-A double-spout jars. This piece illustrates what the Early Nazca people did when they wanted a picture on a piece of cloth: they simply painted it on. They did not seriously attempt to weave or embroider the picture. At Paracas, on the contrary, such attempts were made, especially in embroidery, and, on the whole, with astounding success; but, so far as known, Paracas made no corresponding attempt to paint pictures on its pots.

The specimen in question is of further interest because it is the oldest painted textile as yet known from Peru, though its age in years could only be guessed.

While the wealth of information brought to light by Dr. O'Neale's thorough and accurate analyses primarily illumines the textile art of only one sector and period in Peru, this is an ancient and important one—of importance for the entire pre-Columbian development. When equally fundamental studies for other periods and regions have been made, it can be anticipated that the history of the whole of this art, which reached so unexampled a development in prehistoric Peru, will become a clear and consecutive story.

A. L. KROEBER

ARCHAEOLOGICAL EXPLORATIONS IN PERU

PART III

TEXTILES OF THE EARLY NAZCA PERIOD

INTRODUCTION

A preliminary report on the textiles from Peruvian coastal sites extending from Moche Valley in the north to Nazca Valley in the south has already been published.¹ About a sixth of the 650-odd analytic descriptions summarized by that report applied to fabrics from the Early Nazca period.² These, with the exception of four pieces, were secured on the First and Second Marshall Field Archaeological Expeditions by Dr. A. L. Kroeber in 1925 and 1926, and were made available for study through the cooperation of Field Museum of Natural History. The four exceptions, obtained by purchase or surface gathering in 1905, are part of the Max Uhle Peruvian collection in the University of California Museum of Anthropology. They have been tentatively classified as to period upon the basis of their stylistic similarities to the excavated textiles, and may be identified throughout this paper by the asterisk preceding the site name or specimen number.

The present monograph deals only with specimens from Early sites in the Nazca Valley, primarily Cahuachi, Majoro, and Cantayo, concerning which Dr. Kroeber has very kindly furnished the following information:

"Nazca is the best populated district in the drainage of the Rio Grande. This river is the product of the confluence, rather far down in their courses, of a series of streams. These are, in order from northwest to southeast: the Huayurí; the Rio Grande with the Palpa and Visco as tributaries; the Ingenio; the Aja and Tierra Blanca, which unite below the town of Nazca, about opposite Ocongalla; and another pair, the Taruga and Trancas, which join the Aja-Blanca-Nazca shortly before they all fall into the Huayurí-Grande-Ingenio combination.

"The principal sites investigated by Kroeber are Aja on the Aja just above Nazca city; and, on the south side of the Tierra Blanca-Nazca: Cantayo or Cantallo, upstream from the town; Huayrona, 3 km. below; Majoro, Ocongalla, Agua Santa, and Pueblo Viejo, c. 9-12 km.; Soisongo, on the north side of the stream; Las Cañas; Cahuachi; Estaquerón. The last may be perhaps 20 km. from Nazca. At nearly every site, two or more periods are represented among the remains. These may be as far apart as Nazca A (earliest phase of "Proto-Nazca") and Late Ica or Inca. The determination of period must therefore be made according to tomb, not by mere site. The best preservation conditions for textiles were encountered at Cahuachi, especially on certain terraced bluffs whose graves were preponderantly of Nazca A period, as evidenced by their pottery. Here Kroeber tried to secure all possible specimens of cloth of this earliest stage of culture yet known in the Ica-Nazca area."

A complete list of specimens, with their sites and grave numbers, follows (Table 1). The total, 163, differs from that given in the preliminary paper, 117, mainly because the analysis of Early Nazca colors in the present study necessitated distinguishing between technically identical specimens. Plaited fragments constructed of various numbers of

¹ Lila M. O'Neale and A. L. Kroeber, *Textile Periods in Ancient Peru*, Univ. Calif. Publ. Amer. Arch. Ethn., vol. 28, pp. 23-56, 1930. Herein cited as *Textile Periods*.

² Kroeber places the collection from Cahuachi in the first of the Early Nazca periods, Nazca A. *Idem*, p. 26, Table 1.

strands, and plain weave fragments, often very small, which present no new features, but are evidence of the range of qualities of Early period fabrics, may also be identified by letters or by letters and superior numbers, a¹, b², as additions to the original list.

TABLE 1

FIELD MUSEUM COLLECTION OF EARLY NAZCA TEXTILES: SITES AND GRAVES

*Cacatilla†.....	1
8537	
*Trancast†.....	2
9056, 9058	
*"Nazca"†.....	1
9120	
Cahuachi.....	15
170211a-c ¹⁻² , d ¹⁻⁶ -i	
Ocongalla.....	2
Grave 3: 170413a, b	
Majoro.....	14
Grave A6: 170462a, b; 170465a-e	
Grave A7: 170476a-e, f ¹⁻²	
Ocongalla West.....	1
Grave 6: 170665	
Ocongalla West B.....	2
Grave 1: 170677a, b	
Cantayo.....	13
Grave C-ax 11: 171033	
Grave C-ax: 171045; 171049; 171050	
Grave C-ax 13: 171054; 171055	
Grave C-ax: 171059	
Grave C-ax cache: 171071a ¹⁻² -e	
Cahuachi.....	112
Grave Ag: 171109a ¹⁻² , b ¹⁻⁴ , c; 171110; 171111; 171112; 171113; 171114;	
171115; 171116a, b; 171117; 171118a-e, f ¹⁻³ , g, h; 171119	
Grave Ea: 171124a, b ¹⁻⁴ , c ¹⁻² , d; 171125	
Grave G: 171140a, b ¹⁻² , c; 171141	
Grave Ha: 171180a, b ¹⁻² -d; 171181; 171182a, b; 171183	
Grave Aj 10: 171213; 171214; 171215; 171216; 171217a, b ¹⁻² ; 171218a, b;	
171219a, b; 171220; 171221; 171222; 171223a, b; 171224;	
171225; 171226; 171227a, b	
Grave Aj 11: 171236; 171237; 171238a, b ¹⁻²	
Grave Aj 12: 171258a ¹⁻² , b	
Grave Aj 13: 171262; 171265; 171266a, b; 171267a, b; 171279a, b; 171280;	
171289a-g	
Grave Al 4: 171305a-c; 171306	
Grave Al 5: 171308; 171309; 171310; 171311; 171312; 171314; 171321a, b ¹⁻³	
Grave Ag 7: 171330	
Total.....	163

† Period attributed. The asterisk is used throughout to designate these four pieces whose age is not determined by pottery associated in the same graves.



TYPICAL EARLY NAZCA EMBROIDERY (171218a)

GARMENT TYPES

The Early Nazca collection is treated in this paper as a whole without regard for the several valley sites represented by the finds.

With few exceptions the specimens are partly or badly disintegrated. Some are charred in appearance, and so fragile that they cannot be lifted except as a mass; others are mere fragments of garments, but may be identified with reasonable certainty. The best-preserved examples in the collection are not always complete, although measurements determining their full sizes are often possible.

A suggested inventory of the garments or garment materials represented by one or several examples classifies them under the following types: aprons, kerchiefs, mantles, tunics, turban braids, ribbons and bands, bits of gauze weave fabrics, and fragments of costume details such as passementeries, bands, and fringes.

Briefly, aprons are characterized by the ties or strings which extend from each of the four corners; kerchiefs are small rectangles decorated by various techniques; mantles are large rectangles embroidered, or patterned in the loom; and tunics are typical sleeveless shirts. The smaller accessories of dress do not suggest their original uses, but are certainly not examples of any of the groups just mentioned.

Table 2 shows the relative numbers of these various items of dress in two sets of totals: the first set refers to these specimens which can safely be identified by size or style as specific garments. The second set of totals refers to groups of specimens which include almost certainly identifiable fragments—like the end of an apron tie—and also to those fragments which might have been either aprons, or kerchiefs, or mantles, except that their dimensions, textures, or trimmed edges are more or less characteristic of some of them. Some bits, lacking such scanty clues as the above, have been arbitrarily classified. This procedure has been followed in connection with the many needleknitted fringes and faces or heads which have been allocated to the mantle group, but which with additional evidence may prove to have been parts of head-dresses. Future finds of more perfect specimens will no doubt make possible the identification of more of the garment costume details.

TABLE 2

OBJECT CLASSIFICATION

Aprons:	
Identifiable garments.....	2
171181, 171215	
Identifiable only by stylistic features.....	2
171223b, 171267b	
Kerchiefs:	
Identifiable garments.....	8
*9120, 170462b, 171033, 171059, 171071a ¹ , 171226, 171266a, 171305c	
Identifiable only by stylistic features.....	3
171045, 171118e, 171225	
Mantles:	
Identifiable garments.....	35
170465a, b, d, 170476a, 170665, 171110, 171112, 171118d, 171119, 171182a, b, 171183, 171213, 171214, 171216, 171217b ¹⁻² , 171218a, b, 171219a, b, 171220, 171221, 171222, 171223a, 171224, 171237, 171262, 171265, 171279a, 171305a, b, 171309, 171310, 171311	
Identifiable only by stylistic features.....	40
*8537, *9056, *9058, 170211a-c ¹⁻² , e, h, i, 170413a, b, 170462a, 170465c, 170476b, f ¹ , 170677a, b, 171055, 171071a ² , 171111, 171113, 171114, 171115, 171116a, 171117, 171125, 171141, 171180a, b ¹⁻² , d, 171238a, 171267a, 171321a, b ¹⁻⁵	
Tunics:	
Identifiable garments.....	4
171071d, 171217a, 171266b, 171308	
Identifiable only by stylistic features.....	5
170211f, g, 171071b, 171118b, c	
Bands:	
Identifiable.....	13
170465e, 170476c-e, 171049, 171050, 171054, 171118a, 171140a-c, 171280	
Turban bands:	
Identifiable.....	31
170211d ¹⁻⁶ , 171109a ¹⁻² , b ¹⁻⁴ , c, 171116b, 171118f ¹⁻³ , 171124a, b ¹⁻⁴ , c ¹⁻² , 171227a, b, 171238b ¹⁻² , 171258a ¹⁻² , b	
Cords:	
Identifiable.....	3
170476f ² , 171124d, 171180c	
Slings:	
Identifiable.....	8
171289a-g, 171314	
Pads:	
Identifiable.....	2
171236, 171330	
Identifiable only by stylistic features.....	1
171279b	
Nets:	
Identifiable.....	2
171118g, h	
Feathered material:	
Identifiable only by stylistic features.....	1
171071c	
Wrappings:	
Identifiable.....	2
171306, 171312	
Miscellaneous:	
Identifiable only by stylistic features.....	1
171071e	
Total.....	163



PAINING ON CLOTH IN STYLE OF POTTERY DECORATION
The earliest known Peruvian painted fabric

EARLY NAZCA COLORS

The most striking feature of these Early Nazca textiles is their range of colors. Even before one notes the techniques or other details, one is conscious of the bewildering number of hues, especially in the garments with needleworked design motives or decorative edges. Many of the Late and Inca period tapestries are colorful, but not more colorful than are the Early period fringed and embroidered plain weave garments. The more complex *passementeries* of Nazca, and the intricate embroideries of Paracas (Necropolis period) are constructed of 7, 10, 12, 15, or more colored yarns used both with and without regularly repeated sequences. Unfortunately, color analysis is much less tangible than is the analysis of techniques, but the former's challenge to attention is insistent. The obstacles are fairly obvious to begin with, becoming more rather than less numerous as the work proceeds.

An analyst, attempting to determine the wide range of colors employed by the Early Nazca weavers and embroiderers, not only encounters the difficulty of selecting suitable color names by which to convey his information, but also the difficulty of combining with them the right modifiers to differentiate between colors bearing the same name. For example, no single color is more often found in Peruvian fabrics than Red. In addition to the familiar Brickdust, an Orange-Red, there are Rose-Reds which include more or less appreciable admixtures of Blue. Add to this the tendency of one color to grade imperceptibly into its neighbors, its clearly recognized differences in value (the position on a light-to-dark scale), and in purity or saturation, and analysis becomes a search for the way out of a maze of adjectival phrases.

In an effort to be more specific than to list the frequencies of Early Nazca colors under such embracing and indefinite hue categories as "bright," "medium," "pale," "grayed," "strong" and the like, 350 yarns and swatches were matched against the complete range of color samples presented in Maerz and Paul's *Dictionary of Color*.³ The method has the obvious advantage of yielding a definitive result if painstakingly pursued. In the case of archaeological specimens, the information gained can be only relatively accurate since we know nothing of the amount of wear and consequent change in the colors of a tattered garment by comparison with similar ones from a garment which appears to have been little worn. Nor do we know whether the yarn chosen from a fragment to match against the printed color sample is truly representative of the yarns of the whole garment, were that available.

An additional and insurmountable difficulty: We have no way of determining which of the several closely related hues was the particular one in the mind of the dyer. It is unreasonable to suppose that colors as little varied as those massed in certain areas on Tables 3-9 were deliberately striven for. The amount of water in the dye pot and the length of time the yarns or cloth was left in the dye bath would account for light and dark values of the same color. Dyeing is a tricky business. A carelessly cleaned receptacle or stirring implement can be responsible for complete changes of hue. It is, therefore, with appreciation of the many potential inaccuracies that the following section is offered.

Each portion of this monograph dealing with a subdivision of the Early Nazca collection includes an analysis of the colors which appear to have been suitable for the weavings or embroideries within it. It is planned at this point to treat of the complete range of colors.

³ A. Maerz and M. Rea Paul, *A Dictionary of Color*. New York and London, 1930. Herein cited as Maerz and Paul, or *Dictionary of Color*.

A few excerpts from Maerz and Paul's introductory pages will make the material to be presented more clear. "The order of the colors (as shown on the plates) follows the spectrum, which is here divided into seven main groups: Red to Orange; Orange to Yellow; Yellow to Green; Green to Blue-Green; Blue-Green to Blue; Blue to Red; and Purple to Red. In each of these groups, all the colors that intervene between the stated terminals are found on a single color plate, grading, by small degrees, from the full strength of the colors into white. Each group is given eight successive plates; the first plate in full purity; the seven following plates over increasing amounts of Gray until the colors approach Black. . . .

"The plates are divided into twelve rows and twelve columns, presenting the colors in twelve degrees, from full strength of hue at one end to no hue at the other. . . ."⁴

It is possible, thanks to the mechanical arrangement of the printed color samples, to trace any one color by locating its column letter and row number on successive plates through its degrees of lightness and purity to darkness and dull grayness. During this transition color names in accepted usage change also.⁵ For example, take the familiar Strawberry Pink, Plate 1 H 10. During its progress from light to dark it is known as Candy Pink 2 H 10, Coral Bell 3 H 10, Attar of Roses 4 H 10, Rosewood 5 H 10, Oakheart 6 H 10, Mauve-wood 7 H 10, and finally Chocolate Brown 8 H 10. While the majority of these names are only occasionally used, they all connote Orange-Red in one or another of its variations.

The questions which arise upon viewing or working with a group of Peruvian fabrics often concern the color range. How many hues were in common use; which ones seem to have been in highest favor; were light or dark colors the rule; were certain combinations repeated often enough to suggest conventional color groupings? These questions and others may be answered with a fair degree of accuracy for the Early Nazca weavers as a result of matching 350 yarn swatches with the color samples in the Dictionary.

The Basic Color Tables (3 to 9) show the distribution of frequencies by plates. To repeat, Maerz and Paul state that the first plate of each main color group (Nos. 1, 9, 17, 25, 33, 41, 49) shows its 144 color samples in full purity, and that the successive seven plates (Nos. 2-8, 10-16, 18-24, etc.) are printed over increasing amounts of Gray until the colors approach Black. We may think, then, of the fifth plate in each group as being in middle position on the value (or light-to-dark) scale, and also in middle position on the pure-to-neutral gray scale.

The results given in the basic color tables are condensed in Table 10.

⁴ *Idem*, p. 3.

⁵ See Maerz and Paul's explanation of the sources of the names included in their Dictionary, p. 3.

TABLE 3
BASIC COLOR TABLE SHOWING THE MAERZ AND PAUL COLOR SAMPLES
TO WHICH EARLY NAZCA FABRICS WERE MATCHED

RED-TO-ORANGE COLOR GROUP
(Maerz and Paul's plates 1-8)†

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2								8:1				7:13
3										7:1	5:2	
4					7:1							
5			7:1								5:1	
6								8:1			5:1	6:2 7:1
7												4:1 5:10 6:1 8:1
8											3:1	
9								5:1	6:1	1:5 3:1 8:1	4:1 5:5 6:5	5:2 8:3
10		1:1			4:1		4:5	4:1 6:1 7:1 8:7	4:1	3:2 4:2	5:3	5:1
11				6:2	8:1		4:1	4:1		5:1	5:2 6:7	5:12 6:2 7:1 8:2
12					8:1							

† First figure indicates plate number; figure after colon indicates number of specimens matched to sample. Therefore, 4:5 in the G 10 rectangle shows that five Early Nazca specimens corresponded in color to G 10 on plate 4.

TABLE 4

BASIC COLOR TABLE SHOWING THE MAERZ AND PAUL COLOR SAMPLES
TO WHICH EARLY NAZCA FABRICS WERE MATCHED

ORANGE-TO-YELLOW COLOR GROUP

(Maerz and Paul's plates 9-16)†

	A	B	C	D	E	F	G	H	I	J	K	L
1										15:1	12:1 14:1	16:1
2			16:1				10:1				13:1	
3			11:2		16:1			15:1				
4	13:1			11:1		10:1 12:2		15:1			11:1	13:1
5				12:1		12:1				10:1	12:1	15:1
6	16:1	11:1 12:1			12:2			15:2		12:2	10:3	
7				14:1	13:2	14:1		13:3		13:1 15:1		12:5
8	12:1				15:1		14:1				11:1 13:4	12:6
9	15:1	11:1 14:1			15:1			16:1		12:2	12:3 13:1	12:5 13:6 14:1 15:1
10	15:2		15:3					11:1				13:1 14:2
11					15:1			15:1	14:1	13:3	14:1	12:2
12			15:1									16:5

† First figure indicates plate number; figure after colon indicates number of specimens matched to sample. Therefore, 15:3 in the C 10 rectangle shows that three Early Nazca specimens corresponded in color to C 10 on plate 15.

TABLE 5
BASIC COLOR TABLE SHOWING THE MAERZ AND PAUL COLOR SAMPLES
TO WHICH EARLY NAZCA FABRICS WERE MATCHED

YELLOW-TO-GREEN COLOR GROUP

(Maerz and Paul's plates 17-24)†

	A	B	C	D	E	F	G	H	I	J	K	L
1									22:2	23:1		24:1
2												24:1
3												
4								23:1		21:4 23:1		23:1
5				20:1	23:5							
6	24:1					20:1						24:1
7	24:2											
8					23:1							
9												
10												
11					24:1					24:3		
12												

† First figure indicates plate number; figure after colon indicates number of specimens matched to sample. Therefore, 24:1 in the A 6 rectangle shows that one Early Nazca specimen corresponded in color to A 6 on plate 24.

TABLE 6

BASIC COLOR TABLE SHOWING THE MAERZ AND PAUL COLOR SAMPLES
TO WHICH EARLY NAZCA FABRICS WERE MATCHED

GREEN-TO-BLUE-GREEN COLOR GROUP

(Maerz and Paul's plates 25-32)†

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2								31:5				
3												
4												
5										32:2		
6			32:1		31:2			31:3		32:5		
7			31:2									
8			31:1 32:4									
9								32:1				
10												
11												
12												

† First figure indicates plate number; figure after colon indicates number of specimens matched to sample. Therefore, 31:5 in the H 2 rectangle shows that five Early Nazca specimens corresponded in color to H 2 on plate 31.

TABLE 7
BASIC COLOR TABLE SHOWING THE MAERZ AND PAUL COLOR SAMPLES
TO WHICH EARLY NAZCA FABRICS WERE MATCHED

BLUE-GREEN-TO-BLUE COLOR GROUP

(Maerz and Paul's plates 33-40)†

	A	B	C	D	E	F	G	H	I	J	K	L
1					39:1					37:1 39:1		
2										38:1		
3					40:1			38:1 39:6		39:2		
4					39:1			39:1				
5								40:1		40:1		
6			39:1							39:3 40:1		
7												
8					39:2					39:1 40:3		
9								39:1 40:1				
10								40:1				
11												
12												40:1

† First figure indicates plate number; figure after colon indicates number of specimens matched to sample. Therefore, 37:1 in the J 1 rectangle shows that one Early Nazca specimen corresponded in color to J 1 on plate 37.

TABLE 8

BASIC COLOR TABLE SHOWING THE MAERZ AND PAUL COLOR SAMPLES
TO WHICH EARLY NAZCA FABRICS WERE MATCHED

BLUE-TO-RED COLOR GROUP
(Maerz and Paul's plates 41-48)†

	A	B	C	D	E	F	G	H	I	J	K	L
1	46:1	45:1			47:1							
2		44:1		46:1				48:1				
3				44:1								
4							46:1	47:1				
5					47:2			43:1 46:1				
6			47:1	46:1						46:1 48:1		
7									45:1			
8			48:1									
9												
10					48:1							
11												
12								48:3				48:1

† First figure indicates plate number; figure after colon indicates number of specimens matched to sample. Therefore, 45:1 in the I 7 rectangle shows that one Early Nazca specimen corresponded in color to I 7 on plate 45.

TABLE 9

BASIC COLOR TABLE SHOWING THE MAERZ AND PAUL COLOR SAMPLES
TO WHICH EARLY NAZCA FABRICS WERE MATCHED

PURPLE-TO-RED COLOR GROUP
(Maerz and Paul's plates 49-56)†

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3												
4												
5	56:2		56:1									
6												
7												
8												
9								56:1				
10												
11												
12												

† First figure indicates plate number; figure after colon indicates number of specimens matched to sample. Therefore, 56:2 in the A 5 rectangle shows that two Early Nazca specimens corresponded in color to A 5 on plate 56.

TABLE 10

FREQUENCY DISTRIBUTION OF COLORS OF EARLY NAZCA WOOL YARNS BASED ON MATCHING SWATCHES WITH MAERZ AND PAUL'S COLOR SAMPLES

R-to-O Pls. 1-8			O-to-Y Pls. 9-16			Y-to-Gr Pls. 17-24			Gr-to-BI-Gr Pls. 25-32			BI-Gr-to-BI Pls. 33-40			BI-to-R Pls. 41-48			P-to-R Pls. 49-56		
Pl. nos.	No. hues	No. spec.	Pl. nos.	No. hues	No. spec.	Pl. nos.	No. hues	No. spec.	Pl. nos.	No. hues	No. spec.	Pl. nos.	No. hues	No. spec.	Pl. nos.	No. hues	No. spec.	Pl. nos.	No. hues	No. spec.
LIGHT COLORS																				
1	2	6	9	..	..	17	..	..	25	..	..	33	..	..	41	..	..	49	..	..
2	..	..	10	4	6	18	..	..	26	..	..	34	..	..	42	..	..	50	..	..
3	3	4	11	7	8	19	..	..	27	..	..	35	..	..	43	1	1	51	..	..
4	9	14	12	15	35	20	2	2	28	..	..	36	..	..	44	2	2	52	..	..
MEDIUM COLORS																				
5	12	41	13	11	24	21	1	4	29	..	..	37	1	1	45	2	2	53	..	..
DARK COLORS																				
6	8	21	14	9	10	22	1	2	30	..	..	38	2	2	46	6	6	54	..	..
7	7	19	15	15	19	23	6	10	31	5	13	39	11	20	47	4	5	55	..	..
8	9	18	16	6	10	24	7	10	32	5	13	40	8	10	48	6	8	56	3	4
Tot.	50	123		67	112		17	28		10	26		22	33		21	24		3	4

The relative frequencies of light colors, medium colors, and dark colors as printed in the Dictionary and matched with yarn swatches are as 45:27:118 (total 190), or, in percentages, 24:14:62. The relative frequencies of the swatches matching these light, medium, and dark color samples are as 78:72:200 (total 350), or, in percentages, 22:21:57.

The expressed relationships answer one of the above questions: Early Nazca colors, if our collection is representative, are dark, rich colors, noticeably grayed. They convey impressions of depth and beauty.

Special mention should be made of a few swatches which are darker than the darkest of the printed color samples, and yet not devoid of color. If classified as Black, and apparently they were meant to be considered such, the term must be modified as Blue-Black for specimens 171118a, 171140c, 171141; as Brown-Black for specimens 171112, 171180d; and as Green-Black for specimen 171140b. A number of other swatches which looked Black matched samples on plates 16, 32, 40, 48, and 56. A true Black is rare in the Peruvian textiles from any period.

Animal fibers take dyes more satisfactorily than do vegetable fibers, but the fact that dyestuffs were available to afford a range of 190 colors suggests that the Early Nazcans left their cotton undyed through choice rather than necessity. Probably some examples of Natural Brown have been entered on Tables 3-9, although the color seems also to have been duplicated in dyes and used for both cottons and wools. "White" cotton always has a creamy tint, yet various swatches, assuredly natural, matched color samples 11 E 5 and 12 E 6. The natural Browns are more varied, and about them there is much less certainty.

Wear, exposure, deterioration, and stains change the original color of a garment. Even granted that the Browns or "Whites" entered on the basic tables are natural instead of dyed, the interpretation for the few examples does little to disturb conclusions drawn for the whole group. The section on striped mantles contains a more detailed analysis of the Brown cotton yarns.

The cotton specimens dyed light, medium, and dark hues form a progressive series related as 3:4:12, with percentage ratios 16:21:63 (Table 11). These do not differ greatly from the findings for the whole group.

TABLE 11

FREQUENCY DISTRIBUTION OF COLORS OF EARLY NAZCA COTTON YARNS BASED ON MATCHING SWATCHES WITH MAERZ AND PAUL'S COLOR SAMPLES

	R-to-O		O-to-Y		Gr-to-BI-Gr		Bl-Gr-to-Bl		Bl-to-R	
	Plates	No. spec.	Plates	No. spec.	Plates	No. spec.	Plates	No. spec.	Plates	No. spec.
Light colors			12 B 6 12 E 6	1 2					44 D 3	1
Medium colors	5 K 3	1	13 A 4 13 E 7 13 K 9	1 2 1						
Dark colors	6 K 9 8 J 9 8 L 9 8 L 11	1 1 2 1	14 G 8 15 C 10 15 E 9 15 E 11 15 H 6 16 E 3	1 2 1 1 2 1	31 H 2	1	39 C 6	1		

The Early Nazca color range with its total of 190 hues, by comparison with Maerz and Paul's 7,056 printed color samples, seems extremely limited, but, as will be developed later, the weaver and embroiderer made use of certain combinations which might have been fulfilled by a much smaller number. This is especially true of the embroidered and needle-knitted specimens. Even a cursory survey of the basic tables shows that the majority of the Nazca hues are to be described in terms of Red, Orange, and Yellow. The color samples on a single plate in the Red-to-Orange group of eight and on one in the Orange-to-Yellow group lacked yarn swatches to match them. The greatest number of color samples lacking equivalents among the fabrics are within the Green-to-Blue-Green, Blue-Green-to-Blue, and Purple-to-Red groups, each of which contains a preponderance of Blue.

The paragraphs to follow deal with each of Maerz and Paul's seven major color groups, identify hues within them by names in familiar usage, and point out the equivalences between the Early Nazca colors and the printed samples in the Dictionary.

SEVEN MAJOR COLOR GROUPS

RED-TO-ORANGE COLOR GROUP

This group contains many colors with familiar names, a few of which are given in order that the column letters and row numbers of the tables may take on more specific meanings (Table 12). Light Red, or Pink, is a well-established name "vaguely applied to pale reddish tones of indefinite character."⁶ Oddly enough, only one of the three dozen color samples labeled Pink on plates throughout the Dictionary was matched exactly by yarn swatches, and that one (1 C 10) is definitely a pale Red-Orange. Another color referred to as "Rose," a name "which cannot be restricted to any specific color,"⁷ has even more printed samples bearing its name than has Pink. Three samples have been matched by several of the Early

⁶ Dictionary of Color, p. 173.

⁷ *Idem*, p. 177.

Dark Red-to-Orange hues printed over increasing amounts of Gray to dull them are well represented among the Early Nazca textiles. Swatches match or are similar in color to Ruby (6 L 6), dark Cardinal (6 L 8), Indian Red (6 L 12), old Amethyst (7 C 5), Maroon (7 L 7), and Chocolate (8 H 10).

TABLE 12
RED-TO-ORANGE GROUP
(Plates 1-8)†

Light colors: Plates 1-4														Medium colors: Plate 5														Dark colors: Plates 6-8													
	A	B	C	D	E	F	G	H	I	J	K	L		A	B	C	D	E	F	G	H	I	J	K	L		A	B	C	D	E	F	G	H	I	J	K	L			
1													1													1															
2													2													2									1			1			
3													3											1†		3										1					
4													4												4					1											
5													5										1		5			1													
6													6										1		6									1			2				
7												1	7										1		7												2				
8											1		8												8																
9											2	1	9								1		1	1	9									1	1	1	1				
10			1		1		1	1	1	2			10										1	1	10								3								
11						1	1						11									1	1	1	11			1	1						1	3					
12													12												12				1												
Total number hues..... 14													 12													 24													
Total number specimens matched..... 24													 41													 58													

† Figures indicate that yarn swatches have been matched to color samples in the same relative positions on one, two, or three plates within the light, medium, and dark series.

Five of the six dyed cottons falling within this color group were matched to the dark hues of the series.

⁸ Maerz and Paul state (p. 3) that it "was found necessary to use two Reds; . . . owing to the nearness of the colors in hue, the two subdivisions appear in one group, called above, briefly, Red to Orange, but really a purplish Red to Red and Red to Orange."

ORANGE-TO-YELLOW COLOR GROUP

This group contains the largest number of hues to which yarn swatches could be matched (Table 13). Some of its light colors are known as Straw (10 F 2), Chinese Yellow (10 K 6), Topaz (12 J 8), and Tan (12 L 11). Medium Orange-to-Yellow colors are Gravel (13 A 4), Khaki (13 J 7), and Hazel (13 J 9). The dark grayed Orange-to-Yellow colors are Old Gold (14 K 5), Gold Brown (14 F 12), Russet Brown (14 I 12), Olive Drab (15 J 5), the Umbers (15 A 12 and 15 L 12), and Sagebrush Green (16 E 5). These few, chosen from the many within the group with accepted names, were matched in most instances with Early Nazca yarns.

The swatches matching light and dark colors in the Orange-to-Yellow group were almost equally balanced. As the charts show, the distribution is without conspicuous massing in any quarter, and it is indeed difficult to make determinations for some swatches. A number of the yarns matching the dark hues in the group looked Black.

The dyed cotton cloths loom large among the totals for this group due mainly to the fact that the Brown and White striped mantle fragments are included. The relationship in terms of light, medium, and dark cotton yarns is as 2: 3: 8; in percentages, 15: 23: 62.

TABLE 13
ORANGE-TO-YELLOW GROUP
(Plates 9-16)†

Light colors: Plates 9-12													Medium colors: Plate 13													Dark colors: Plates 14-16															
	A	B	C	D	E	F	G	H	I	J	K	L		A	B	C	D	E	F	G	H	I	J	K	L		A	B	C	D	E	F	G	H	I	J	K	L			
1												1	1													1											1	1	1		
2								1					2											1		2			1												
3			1										3													3				1				1							
4				1		2						1	4	1											1	4							1								
5				1		1						1	5													5												1			
6		2			1							1	6													6	1							1							
7												1	7				1				1		1			7			1		1				1						
8	1											1	8											1	8				1		1										
9		1										1	9											1	9	1	1			1				1				2			
10								1					10												1	10	1		1									1			
11												1	11													11				1				1	1		1				
12													12													12			1									1			
Total number hues.....																									26	11	30
Total number specimens																									49	24	39
matched.....																									49	24	39

† See footnotes under Red-to-Orange Color Group, Table 12.

YELLOW-TO-GREEN COLOR GROUP

The light and medium colors in this group (Table 14) are almost completely unrepresented by Early Nazca swatches, which contained nothing approximating Spring Green (18 J 7), Pistachio, or Apple Green (19 C 6 and 19 J 6). Swatches similar to the light Yellow-Greens known as Pea Green (20 G 6) and Grass Green (21 L 5) were found, and the dark Yellow-to-Green colors were matched many times by yarns similar to Reseda (22 K 1), Lincoln (23 J 4), and Hunter Green (24 C 11). The majority of the Early Nazca yarns are to be described as Yellowish-Green rather than as Green or Bluish-Green.

TABLE 14
YELLOW-TO-GREEN GROUP
(Plates 17-24)†

Light colors: Plates 17-20												Medium colors: Plate 21												Dark colors: Plates 22-24														
	A	B	C	D	E	F	G	H	I	J	K	L		A	B	C	D	E	F	G	H	I	J	K	L		A	B	C	D	E	F	G	H	I	J	K	L
1													1													1									1	1		1
2													2													2												1
3													3													3												
4													4										1			4								1		1		1
5				1									5													5				1								
6					1								6													6	1											1
7													7													7	1											
8													8													8				1								
9													9													9												
10													10													10												
11													11													11				1					1			
12													12													12												
Total number hues 2													. . . . . 1													. . . . . 14												
Total number specimens													. . . . . 4													. . . . . 22												
matched 2													. . . . . 4													. . . . . 22												

† See footnotes under Red-to-Orange Color Group, Table 12.

GREEN-TO-BLUE-GREEN COLOR GROUP

Light and medium colors of this group are without a single representative among the 350 Early Nazca yarns (Table 15). This seems all the more remarkable from the point of view of the modern colorist who accepts the more or less pure Turquoise Blue (25 J 2) and Emerald Green (26 C 11) as part of a familiar color range. The colors of this group, mostly unnamed, for which there were equivalents among the yarn swatches are both dark and dull: Thyme Green (31 E 6), Poplar Green (31 C 8), Jasper Green (32 H 9).

TABLE 15
GREEN-TO-BLUE-GREEN GROUP
(Plates 25-32)†

Dark colors: Plates 30-32											
A	B	C	D	E	F	G	H	I	J	K	L
1											
2							1				
3											
4											
5									1		
6		1		1			1		1		
7		1									
8		2									
9							1				
10											
11											
12											
Total number hues 10											
Total number specimens											
matched 26											

† See footnotes under Red-to-Orange Color Group, Table 12.

BLUE-GREEN-TO-BLUE COLOR GROUP

This group, as in the case of the preceding Green-to-Blue-Green group presents plate after plate of color samples for which there are no equivalents among the Early Nazca yarns (Table 16). There are no so-called Light Blues (six graded steps of which have been standardized by the Textile Color Card Association of the United States), no Cobalt Blue (34 L 7), Blue Bird (36 J 9), nor anything like these pure light hues. Three swatches (one 38 J 2, unnamed) are approximately medium Blue-Green. The bulk of the representatives are low, dark colors similar to Slate (39 A 7), Flemish Blue (39 E 10), and Navy (40 E 11). As may be seen by the chart, the frequencies are massed within the Blue-Green rather than the Blue portions of the plates.

TABLE 16
BLUE-GREEN-TO-BLUE GROUP
(Plates 33-40)†

Medium colors: Plate 37													Dark colors: Plates 38–40												
A	B	C	D	E	F	G	H	I	J	K	L		A	B	C	D	E	F	G	H	I	J	K	L	
1									1				1				1					1			
2													2									1			
3													3			1			2		1				
4													4			1			1						
5													5							1	1				
6													6		1							2			
7													7												
8													8			1						2			
9													9							2					
10													10								1				
11													11												
12													12										1		
Total number hues 1												 21												
Total number specimens matched 1												 32												

† See footnotes under Red-to-Orange Color Group, Table 12.

BLUE-TO-RED COLOR GROUP

The colors within this series contain Red in varying amounts, and seem, therefore, either to have been more easily obtainable, or to have been in greater favor than were those without a reddish tinge. The lighter colors of the group, Orchid (41 F 5), Wistaria (41 E 8), Pansy (41 K 12), and Cornflower (42 C 10), are without representatives among the Early Nazca yarns matched to the samples (Table 17). A light Bluish Red, unnamed (43 H 5), and two more similar to Heliotrope Gray (44 C 3) were found. The medium colors of this series were also lacking, in the main. One matched yarn was identical to Dove Gray (45 B 1), and a second similar to Amethyst (45 J 8). The dark colors of the Blue-to-Red group were matched by many yarns. Bluish Reds are not common among Peruvian textiles of any period, the nearest approach in most instances being the Rose hues. But among the Cahuachi garments there are several examples of Purple. From the quantity standpoint, the Mauves and Slates are not noticeable, but where they do appear they stand out by reason of their rarity. The largest amounts are to be found in the flower-motive Cahuachi mantle 171222. It may be that in a collection representing more Early Nazca sites, Mauve would serve to identify an Early textile as surely as the strong rich Blues confirm the age of a fabric of the Tiahuanaco period.⁹

⁹ Textile Periods, p. 42.

The best-known names for the dark colors in the series are Old Mauve (46 I 5), Blue Fox (47 E 1), Slate (47 C 6), Gunmetal (48 C 2), and Egg Plant (48 H 12). Some of these colors are identical to those found among the Early Nazca yarns.

TABLE 17
BLUE-TO-RED COLOR GROUP
(Plates 41-48)†

Light colors: Plates 41-44												Medium colors: Plate 45												Dark colors: Plates 46-48																
	A	B	C	D	E	F	G	H	I	J	K	L		A	B	C	D	E	F	G	H	I	J	K	L		A	B	C	D	E	F	G	H	I	J	K	L		
1													1	1												1	1			1										
2		1											2													2			1				1							
3				1									3													3														
4													4													4						1	1							
5								1					5													5				1			1							
6													6													6		1	1							2				
7													7									1				7														
8													8													8		1												
9													9													9														
10													10													10				1										
11													11													11														
12													12													12							1					1		
Total number hues 3													. . . . . 2													. . . . . 16													
Total number specimens													. . . . . 2													. . . . . 19													
matched 3													. . . . . 2													. . . . . 19													

† See footnotes under Red-to-Orange Color Group, Table 12.

PURPLE-TO-RED COLOR GROUP

Although this series of colors has only three for which equivalents were found among the Early Nazca fabrics, the relationship to the more familiar Reds is close (Table 18).

TABLE 18
PURPLE-TO-RED COLOR GROUP
(Plates 49-56)†

Dark colors: Plates 54-56											
A	B	C	D	E	F	G	H	I	J	K	L
1											
2											
3											
4											
5	1		1								
6											
7											
8											
9							1				
10											
11											
12											
Total number hues 3											
Total number specimens											
matched 4											

† See footnotes under Red-to-Orange Color Group, Table 12.

It does seem worthy of note that within 350 matched swatches there should be none similar to Fuchsia (50 I 12), Magenta (52 K 12), Hollyhock Red (53 K 11), Heliotrope (54 C 10), or other of the light and medium Purple Reds. The three examples found are from the darkest and dullest of the Purple Reds—one of them Old Burgundy (56 H 9)—and appear to be Black until matched to the color samples.

Summary Table 19 records the results of matching 350 colored yarns and fabric swatches against the printed samples in the Dictionary. It shows the preponderance of hues within certain of the Color Groups from two angles: that of the actual number of hues—light, medium, and dark—for which equivalents were found among the Early Nazca yarns, and that of the actual number of specimens falling within each Color Group. It proves for the available data that the dark hues represented outnumber the combined number of light and medium hues, and that over half of the yarn specimens matched to the printed samples fall within the dark classification. What mere figures cannot tell, and what printed samples can only suggest, is the very real beauty of the dyed wool yarns, the luster and the depth of the colors. For these Early Nazca colors merit every superlative which has been used for those of the later periods. There are no streaky yarns, so far as one can determine, and no other evidences of feeble or inept attempts to arrive at definite results. The Early period colors, as well as the techniques, prove that we are still a long way from the beginnings of the textile art in Peru.

TABLE 19
SUMMARY TABULATION OF HUES REPRESENTED AMONG EARLY NAZCA FABRICS

	HUES REPRESENTED			PERCENTAGES			SPECIMENS MATCHED			PERCENTAGES		
	Light	Medium	Dark	Light	Medium	Dark	Light	Medium	Dark	Light	Medium	Dark
Red-to-Orange	14	12	24	28	24	48	24	41	58	19	33	47
Orange-to-Yellow	26	11	30	39	16	45	49	24	39	43	22	35
Yellow-to-Green	2	1	14	12	6	82	2	4	22	7	13	80
Green-to-Blue-Green	0	0	10	..	..	100	0	0	26	..	..	100
Blue-Green-to-Blue	0	1	21	..	5	95	0	1	32	..	3	97
Blue-to-Red	3	2	16	14	10	76	3	2	19	13	8	79
Purple-to-Red	0	0	3	..	..	100	0	0	4	..	..	100
Totals	45	27	118	..	..	..	78	72	200	..	..	..
Percentages	24	14	62	..	..	..	22	21	57	..	..	..

EARLY NAZCA YARNS

It is axiomatic that fine textiles demand finely spun yarns, and that finely spun yarns depend upon fiber quality and skillful manipulation. The ancient Peruvians had both white and brown cottons, the former whiter, a little longer, and more even in structure than the latter. Crawford remarks that the brown cotton "is claimed by some authorities to be a sport of the former and not a separate species, its reddish color being an indication of a reversion to a wild type."¹⁰ Means refers to "natural shades: white, brown, and blue or grayish blue, the latter two being due to the action of a pest which attacks the cotton boll."¹¹

Although Crawford described a group of technically interesting fabrics without regard for their chronological relationships, his generalizations as to the quality of the old Peruvian yarns with few exceptions apply to the yarns in the Early Nazca pieces of the Field Museum collections. Especially did he note the evenness of the spinning, the intentional insertion of a great degree of twist in some yarns, and the lesser amount of twist in others. The heavily twisted yarns give a crêpe texture to the fabric, while the yarns less heavily twisted have "bite" enough to keep them in place in open voile-like fabrics.¹²

¹⁰ M. D. C. Crawford, *Peruvian Textiles*, Amer. Mus. Nat. Hist., Anthr. Papers, vol. 12, p. 64, 1915.

¹¹ P. A. Means, *A Study of Peruvian Textiles in the Museum of Fine Arts*, Boston, p. 41, 1932.

¹² *Idem*, pp. 77-81.

EARLY NAZCA MANTLES

The mantle is not only the largest of the Early Nazca garments, but seems also to have been the one upon which the greatest amount of technical skill and artistic effort was expended. This conclusion is based upon a relatively small number of specimens furnishing complete dimensions together with those fragments which sufficiently resemble mantles in size, texture, color, or decoration to be allocated to the group. The preponderance in numbers of this latter series may be seen by comparing Tables 20 and 21.

TABLE 20
BASIC TABLE: MANTLE TYPES, DIMENSIONS, AND WARP-WEFT COUNTS PER INCH

	Specimen number	Full length (inches)	Frag. length (inches)	Full width (inches)	Frag. width (inches)	Prop. W : L	Warps per inch	Wefts per inch
Plain weaves, undecorated	170476a		43	16			32	18
	171118d		10		9		26	26
	171182a	56		48		0.857	22	26
	171182b		27	25			28	34
	171213		30		25		28	24
	171214	55		45†		0.818	36	36
	171217b ¹		22		14		26	26
	171217b ²		16		21		36	26
	171219b		27	26			40	38
	171305a	68		52†		0.764	34	30
Striped	170465b		10	27			42	16
	170465d		x†		x		36	20
	170665	44			9		32	26
	171183		x		x		80	22
	171262	60		52†		0.866	26	24
	171265	48		38		0.791	22	22
	171305b		27	36			34	32
	171310		66		37†		34	14
	171311		x		x		34	26
Embroidered (or brocaded)	170465a		24	37*			58	32
	171216	57		47.5		0.833	28	34
	171218a**		38		44.5		28	26
	171219a**	80(?)	30.5	65	38.5	0.821	26	26
	171220**		25		33		26	24
	171222	50		41.5		0.83	28	24
Needleknitted edge	171112		36	14			34	28
	171223a	52			34†	0.961	38	34
	171224	50			45†	1.00	40	40
	171237		39	28			32	30
	171309		x		x		36	36
Pattern weave	171119	40		40†		1.00	26	26
	171218b		9		26.5		24	24
	171279a		32		38†		28	36
Gauze	171110		32		9		30	24
Miscellaneous	171221		24	70†			28	32

† Formed of two breadths, seamed together.

‡ The x indicates small fragments of unimportant dimensions; specimen 171309 badly charred.

* Single breadth of two-breadth mantle, judging by the needleholes the full length of one side edge.

** Fragments of single mantle herein considered as one specimen, Cahuachi 171220. See description in section on Brocaded and Embroidered Mantles.

Table 20 lists every specimen which with little or no doubt can be classified as a mantle. Table 21 summarizes by counts those assumedly identifiable specimens, and also those fragments which have been arbitrarily allocated to the different mantle sub-groups.

TABLE 21
SUMMARY TABLE OF MANTLE SPECIMENS

	Full length specimens	Full width specimens	Complete dimensions	Incomplete dimensions	Arbitrarily† allocated	Total in group
Plain weave, undecorated.....	3	5	3	7	13	23
Plain weave, striped: cotton.....	..	2	..	5	..	5
Plain weave, striped: wool.....	3	3	2	2	3	7
Plain weave, embroidered or brocaded.....	3	4	3	1	1	5†
Plain weave, needleknitted edge.....	2	4	2	3	17	22
Plain weave, pattern-weave borders.....	1	2	1	2	..	3
Gauze weave.....	..	..	..	1	2	3
Miscellaneous						
"Patchwork".....	..	..	..	..	2	..
Interlocked wefts.....	..	..	..	..	1	..
Painted.....	..	..	..	..	1	..
Twined.....	..	1	..	1	..	5
Totals.....	12	21	11	22	40	73

† Allocations based upon technological and stylistic features; specimens in this column do not appear in yarn count, Table 20.

‡ See Table 20, footnote **.

MANTLE DIMENSIONS

Table 20 lists the several mantle types with the dimensions and warp-weft counts for each specimen. Generalizations based upon this table are made with full recognition of the subjective element which necessarily entered into the allocation of the fragmentary specimens. The complete lengths of twelve out of the thirty-three¹³ mantles show a range through 40" with intervals as follows: 40", 44", 48", 50", 50", 52", 55", 56", 57", 60", 68", 80"(?). Median approximately 53".

Complete widths are preserved for twenty-three out of the thirty-three mantles, assuming for five of the specimens that a full breadth plus a fragment of a second breadth seamed to it justifies an inference that the original mantle was twice the width of the full breadth. The complete widths inferred from such evidence are indicated by an asterisk. The range extends through 60" (median 41"-45") with intervals as follows: 14", 16", 25", 25", 26", 27", 28", 36", 38", 40" (20"+20"), 41.5", 45" (22"+23"), *45" (22.5"+frag. 14.5"), *46" (23"+frag. 15"), 47.5", 48", *50" (25"+frag. 9"), *50" (25"+frag. 20"), 52" (25"+27"), 52" (26"+26"), 65", 70" (35"+35"), *74" (37"+?).

These same figures present another feature of Early Nazca weavings: the variations in measurements between single breadths of the same mantle. Over half of the complete mantle widths represent a single set-up of the warps, and the remainder represent two narrow webs seamed together to form the desired size. Omitting from consideration the fragmentary webs for which inferences have been made, the measurements of single fabric breadths range through 51", with intervals as follows: 14", 16", 20" (2 specimens), 22", 22.5", 23" (2 specimens), 25" (5 specimens), 26" (3 specimens), 27" (2 specimens), 28", 35" (2 specimens), 36", 37", 38", 41.5", 47.5", 48", 65". Median 26".

¹³ See Table 20, footnote **.

About a third of the Early Nazca mantles are complete both as to length and width measurements. Listed in the order of proportions of width to length they are as follows:

TABLE 22
WIDTH-TO-LENGTH PROPORTION OF MANTLES

Specimen number	Type	Length (inches)	Width (inches)	Proportion W:L
171305a.....	Plain	68	25+27	0.764
171265.....	Striped	48	38	0.791
171218a } 171219a } 171220 }	Embroidered	80†	65	0.812
171214.....	Plain	55	22+23	0.818
171222.....	Embroidered	50	41.5	0.83
171216.....	Embroidered	57	47.5	0.833
171182a.....	Plain	56	48	0.857
171262.....	Striped	60	26+26	0.866
171223a.....	Needleknitted edge	52	25+25‡	0.961
171224.....	Needleknitted edge	50	25+25‡	1.0
171119.....	Pattern	40	20+20	1.0

† Inferred complete length; see section on Embroidered Mantles.

‡ Inferred width of second breadth.

MANTLE WARP-WEFT YARN COUNTS

Theoretically, the fineness or coarseness of a piece of fabric is determined by the number of warps and wefts per inch. In reality, "fineness" and "coarseness" are relative terms, and one must know more than the actual counts involved. For instance, 18 warps and 18 wefts per inch might, in the case of one specimen, indicate a coarse material made of heavy yarns, although for another it might indicate, as it does in specimens 170211c¹⁻², that the yarns were fine but widely spaced in the warp set-up and loosely battened during the weaving. Hence, it is desirable to compare textures as well as counts. Another factor in the analysis of archaeological material makes for less accuracy than could be desired: a cloth from modern looms can be held tautly at approximately the same tension that it was during the weaving, but no such tension is practicable, or even possible, in handling most of the ancient pieces. Consequently, one may be able to count the yarns more accurately in the pieces in good condition. A third factor must also be considered: the quality of hand weaving varies in different parts of the fabric, sometimes markedly. As a rule, counts taken in several different places on the web, choosing always the best-preserved portions, is a fairly accurate method, but even with that precaution it is at times necessary to average warp counts running 30, 32, 36, 44, and weft counts 30, 32, 36 per inch as found in mantle specimen 171223a. In some pieces the variance is due to uneven beating up of the weft yarns, and in others to uneven spinning. Since textures are difficult to describe in terms which will mean the same to all readers, Table 23 simply presents the counts for the thirty-three mantle specimens in the order of the number of warps, together with the ply-composition analysis of the weaving yarns.

The mantle group is large enough to provide a representative sample of Early Nazca weavings. Table 23 shows that, beginning with 22 warps per inch, the progression is regularly by 2's up to and including 42; median 32.

Weft counts per inch range from 14 through 40, median 26, a difference of 26 points as against the difference of 62 points in the warp counts. The sequence of weft counts is as follows: 14, 16, 18, 20, 22 (twice), 24 (5 times), 26 (8 times), 28, 30 (twice), 32, 34, 36 (each 3 times), 38, 40. Median 26.

There are only three possible relationships between the number of warps and the number of wefts per inch in a fabric: they balance each other in number, in "square count"

fabrics; the warps outnumber the wefts in "warp face" fabrics; or the wefts outnumber the warps in "weft face" fabrics. The latter type is best illustrated by the tapestries, in which the warps are completely covered by the wefts. For the Early Nazca collection the relationships between square count, warp face, and weft face in the mantles (9:19:5) may be expressed in percentages as follows: 27:58:15. The warps outnumber the wefts per inch within a wide range: 2 and 4 (each 4 times), 6 (3 times), 8, 10, 14, 16, 20, 26 (twice), 58. The wefts outnumber the warps with unappreciable differences between them of 4, 6, or 8 per inch. Apparently weft-face fabrics were not intentionally made, but resulted from accidentally battening the weft yarns too vigorously.

TABLE 23

SEQUENCE OF MANTLE WARP-WEFT COUNTS; YARN STRUCTURE AND COMPOSITION

Plain	Striped	Brocaded and embr.	Needle- knitted	Pattern	Gauze	Misc.	Warp count per inch				Weft count per inch			
							C1†	C2	W1	W2	C1†	C2	W1	W2
..	X	..	..	..	..	..	..	22	22	22	..	..	22	22
X	..	..	..	..	..	..	..	22	..	..	..	26	..	..
..	..	..	..	X	..	..	..	24	..	..	..	24	..	..
..	X	..	..	..	..	..	..	..	26	26	..	..	24	24
..	..	..	..	X	..	..	..	26	..	..	..	26	..	..
..	..	X†	..	..	..	..	..	26	..	..	..	26	..	..
X	..	..	..	..	..	..	..	26	..	..	..	26	..	..
X	..	..	..	..	..	..	..	26	..	..	..	26	..	..
X	..	..	..	..	..	..	..	28	..	..	..	24	..	..
..	..	X	..	..	..	..	..	28	..	..	..	24	..	..
..	..	..	..	..	..	X	..	28	..	..	..	32	..	..
..	..	X	..	..	..	..	..	28	..	..	..	34	..	..
X	..	..	..	..	..	..	..	28	..	..	..	34	..	..
..	..	..	..	X	..	..	..	28	..	..	..	36	..	..
..	..	..	..	..	X	..	..	30	..	..	..	24	..	..
X	..	..	..	..	..	..	32	..	..	..	18	..	..	..
..	X	..	..	..	..	..	..	..	..	32	..	..	..	26
..	..	..	X	..	..	..	..	32	..	..	..	30	..	..
..	X	..	..	..	..	..	..	..	..	34	..	..	..	14
..	X	..	..	..	..	..	..	34	..	..	..	26	..	..
..	..	..	X	..	..	..	..	34	..	..	..	28	..	..
X	..	..	..	..	..	..	..	34	..	..	..	30	..	..
..	X	..	..	..	..	..	..	34	..	..	..	32	..	..
..	X	..	..	..	..	..	..	36	..	..	..	20	..	..
X	..	..	..	..	..	..	..	36	..	..	..	26	..	..
X	..	..	..	..	..	..	..	36	..	..	..	36	..	..
..	..	..	X	..	..	..	..	36	..	..	..	36	..	..
..	..	..	X	..	..	..	..	38	..	..	..	34	..	..
X	..	..	..	..	..	..	..	40	..	..	..	38	..	..
..	..	..	X	..	..	..	..	40	..	..	..	40	..	..
..	X	..	..	..	..	..	..	42	..	..	..	16	..	..
..	..	X	..	..	..	..	..	58	..	..	..	32	..	..
..	X	..	..	..	..	..	..	80	..	..	..	22	..	..

† See Table 20, footnote **.

‡ Cotton or wool fiber indicated by letter; number of ply by figure. C1 means single-ply cotton yarn; W2 means two-ply wool yarn.

CORRELATION BETWEEN MANTLE TYPES AND WARP-WEFT COUNTS

One might reasonably expect to find some specific degree of quality as indicated by the yarn counts in Table 23 associated with mantles of particular types. Perhaps with a greater number of complete specimens this correlation could be demonstrated, but with the available material it is possible only to suggest certain relationships (Table 24).

(1) The mantles listed as plain, undecorated, represent an assortment of filmy textures and muslins whose warp counts show them to be almost equally divided on either side of

the complete group median, 32 per inch, although the weft counts are preponderantly higher than the group median, 26.

(2) The nine striped mantle specimens are as varied in count as the plain, undecorated ones, but with them texture and yarn fiber must be considered. Counts for the unusual all-wool mantles of looser weave are on the coarse side of the complete group median, but all the counts of the warp face cotton mantles are on the fine side.

(3) Three of the four embroidered mantles, and the three scrim-like mantles with pattern-weave borders, have counts within a narrow range, but the number of specimens is too small in both instances to justify drawing conclusions.

(4) The single mantle type which does consistently seem to have been made of high-count materials is that with the needleknitted edges, to judge from five examples. This form of decoration is by far the most elaborate and time-consuming of all the forms found in the Early Nazca collection. It is conceivable that some of the finer fabrics among the unidentifiable fragments were originally woven for mantles edged with needleknitted fringes.

TABLE 24
CORRELATION BETWEEN MANTLE TYPES AND WARP-WEFT COUNTS PER INCH

Plain, undecorated	Striped	Embroidered and brocaded	Needleknitted edge	Pattern border	Miscellaneous
22 x 26	22 x 22†	.....	.....	.....	.....
.....	.....	.....	.....	24 x 24	.....
26 x 26	26 x 24†	26 x 26	.....	26 x 26	.....
26 x 26	.....	.....	.....	.....	.....
28 x 24	.....	28 x 24	.....	.....	28 x 32
28 x 34	.....	28 x 34	.....	28 x 36	.....
.....	.....	.....	.....	.....	30 x 24
32 x 18‡	32 x 26*	.....	32 x 30	.....	.....
.....	34 x 14*	.....	.....	.....	.....
34 x 30	34 x 26	.....	34 x 28	.....	.....
.....	34 x 32	.....	.....	.....	.....
36 x 26	36 x 20	.....	.....	.....	.....
36 x 36	.....	.....	36 x 36	.....	.....
.....	.....	.....	38 x 34	.....	.....
40 x 38	.....	.....	.....	.....	.....
.....	.....	.....	40 x 40	.....	.....
.....	42 x 16	.....	.....	.....	.....
.....	.....	58 x 32	.....	.....	.....
.....	80 x 22	.....	.....	.....	.....

† Yarns single-ply wool and two-ply wool in warps and wefts.

‡ Single-ply cotton yarns in both warps and wefts.

* Two-ply wool yarns in both warps and wefts.

MANTLE YARNS

Wool and cotton yarns of both single-ply and two-ply construction are found in the mantles. The ratio of all-cotton to all-wool specimens is as 29:4. There are no union cotton-wool basic webs in the group of identifiable mantles. In the all-cotton group, one specimen, mantle 170476a, is woven of single-ply cotton; two of the all-wool striped mantles are woven of single-ply and two-ply wools, and the remaining 28 mantle webs are of two-ply cotton.

The most important point concerning the yarn composition of these Early Nazca mantles is that wool invariably appears as decorative yarn wherever there is embroidery, needleknitted edges, or pattern-weave borders. The all-cotton mantle with brightly colored wool decoration was obviously a convention or a choice rather than a necessity dictated by a limited wool supply. The few all-wool mantles do seem more elegant garments because of

their striking colors, but that judgment is based entirely upon an appreciation of efforts which may or may not have been so highly esteemed by the native weavers.

PLAIN WEAVE UNDECORATED MANTLES

Were we dealing with complete garments instead of arbitrarily allocated fragments in more than half the cases, this largest group of specimens might prove to include examples of embroidered, patterned, or other mantle types. Structurally, there is nothing except its texture and color to differentiate one of these all-cotton fabrics from the rest. But the texture does vary sufficiently to necessitate the use of different descriptive words: filmy crêpes and voiles for the sheer fabrics made of tightly twisted yarns (170476a), loosely woven materials of medium twist yarns, similar to the heavier qualities of our coarse muslins (171214, 171217b¹⁻² [Frontispiece, Plate XXXII], 171219b), and crashes identical to some Osnaburg, and also to the modern hand-woven "Ghandi" cloths of India (171213, 171305a).¹⁴

Half of the mantle fragments, including one complete specimen (171214), are dyed, a fact which suggests that the colored cotton mantles may have been left undecorated. Mantle 171214 has the appearance and texture of a good piece of modern crash, evenly woven, and with noticeably well-managed side selvages. This mantle is also an example of loom joining or fine seaming in that an extra yarn draws together the two edges by engaging single weft turns as shown in Plate LXVII_f. The colors of the dyed mantles are all medium or dark on the value scale: two Brownish Rose hues, 6 J 9 and 6 K 9 (171217b¹ and 171213), Heliotrope Gray, 44 D 3 (170476a)—the Reddish Purple referred to in the section on color as one means of identification for the Nazca Valley textiles of this Early period—a Bluish Green, 31 H 2 (171214), and a dark Gray Blue, 39 C 6 (171118d). The remaining plain weave undecorated mantles are White or Natural Brown cotton (8 L 9 and 8 L 11).

PLAIN WEAVE UNIDENTIFIABLE GARMENT MATERIALS

Table 25 records the principal items relating to a group of all-cotton fragments which may or may not have been mantles, veils, tunics, kerchiefs, or wrapping cloths. The dimensions tell nothing for any of them. Since the pieces are without edge finishes or other form of decoration, there is no possible means of identifying them. Their place in this study is to show what variations in textural appearance result from choices of yarns.

TABLE 25
UNIDENTIFIABLE PLAIN WEAVE FRAGMENTS

Specimen number	Warps per inch		Wefts per inch		Square count	Warps per inch in excess of wefts	Wefts per inch in excess of warps	Texture	Color
	C1†	C2	C1	C2					
170211h.....	..	30	..	30	x	..	..	Coarse muslin	White
170211i.....	..	34	..	40	..	..	6	Fine scrim	White
170413a.....	28	..	24	..	..	4	..	Filmy	White
170413b.....	..	42	..	22	..	20	..	Canvas	Brown
170462a.....	..	44	..	22	..	22	..	Canvas	Brown
170465c.....	..	38†	..	24	..	14	..	Canvas	Brown
170476b.....	30	..	24	..	..	6	..	Filmy	Dyed
170677a.....	28	..	22	..	..	6	..	Filmy	White
170677b.....	34	..	28	..	..	6	..	Filmy	Dyed
171055.....	..	48	..	16	..	32	..	Canvas	Brown?
171071a ².....	..	38	..	30	..	8	..	Muslin	White
171238a.....	..	28	..	28	x	..	..	Muslin	White
171267a.....	..	22	..	18	..	6	..	Coarse muslin	White

† See footnote ‡, Table 23.

‡ The warp and weft counts given are averages of the counts of the two breadths of material forming the fragment: 36 x 20 and 40 x 26.

¹⁴ See Henry W. Nichols and William H. Broomhead, *Standard Cotton Cloths and Their Construction*, Fall River, Mass., 1927, for brief descriptions and fabric swatches.

These unidentifiable pieces are best characterized by their textures. The single-ply filmy fabrics have warp counts which differ from the weft counts by four or six yarns per inch, and two of the muslin-like materials are square count, but the canvas-like materials are noticeably warp face, the warps outnumbering the wefts by 14, 22, 24, and 32 per inch.

The finest pieces from the standpoint of technique are specimens 170211h, i, similar in appearance to the best quality modern scrim. The heaviest pieces are two canvas cloths (170465c) seamed together with a coarse running stitch (Plate LXVIIi). The only other fragment with a seam is 170677b, which was constructed of two breadths drawn together with "sham" hem stitches; five to the inch (Plate LXVIIId).

One piece, specimen 170211i, is creamy White; most of the others are either Natural Brown cottons (8 L 9, 14 F 7, and 15 C 10) or darkened White cottons. Two were dyed, both veils, possibly, one of which now looks dark Gray in some places, dark Gray Green (15 H 6) in others, and the second Orange (13 K 9). They are both woven of single-ply yarns, crêped, and the texture is gauze-like (170476b and 170677b).

PLAIN WEAVE STRIPED MANTLES

The classification of these garment materials is based upon measurements, textures, and patterns. The group is about equally divided between the all-cotton and the all-wool mantles. There are no complete lengths for the first group, and but two intact breadth measures: 27" and 36". The striped wool mantles are in better condition, as Basic Table 20 shows. Three specimens furnishing complete length measurements are 44", 48", and 60" long. An incomplete length of 5'6" is evidence that some striped mantles were woven at least as long as was plain weave mantle 171305a, which measures 5'8". Complete widths for the all-wool striped mantles are within the usual range.

Striped materials are often warp-face materials, and although the actual warp counts per inch do not in themselves set the cotton mantle group apart, the appearance of the fabrics is characterized by the preponderance of warp yarns over weft yarns per inch. For comparison the warp-weft counts of the all-cotton and all-wool mantles are placed in two columns:

COTTON			WOOL		
Warps per inch	Wefts per inch	Warps per inch in excess of wefts	Warps per inch	Wefts per inch	Warps per inch in excess of wefts
34	x 26	8	22	x 22	0
34	x 32	2	26	x 24	2
36	x 20	16	32	x 26	6
42	x 16	26	34	x 14	20
80	x 22	58			

The contrast in textures of the two sub-groups is indicated to some degree by the counts. The all-wool materials are more loosely woven, and, although sturdy, could not be described as suitable for hard wear. The cotton mantles are durable-looking garments, fairly smooth as to surface, and undoubtedly the less elegant of the two types.

STRIPED COTTON MANTLES

The most interesting feature of the striped cotton mantles as a group is the choice and arrangement of the colors which make up the stripes. The number of colors to be found in the specimens varies from two to four, including White and Natural Brown. The available mantles form so small a group that each mantle fragment is described in terms of its color sequences and proportions. The warps in all five instances were set up in the loom in color units of 2, 4, 6, or 8 yarns. The bands of warps for the wider stripes seem to have been measured for width rather than counted. The wefts are White with the exception of those in one specimen.

The simplest 2-color arrangement is illustrated by Cahuachi specimen 171305b. A three-inch plain White stripe borders each side of the web. The central 30" portion of the breadth shows a set-up of 8 Natural Brown warps, 8 White, 8 Brown, and repeat (Plate XXXVIb).

A 3-color specimen, Majoro 170465b, is more interesting. This fragment illustrates a distinguishing feature of Peruvian color sequences: the permutation of three or more colors, a device which achieves a variety not suggested by the limited range (Plate XXXVIe). The specimen also maintains a second sequence in the number of warps set up for each stripe. White, Natural Brown or Tan, and a darker Brown are arranged as follows:

W BR W — BR T BR — T BR T — BR W BR — repeat
8 2 6 8 2 6 8 2 6 8 2 6 — repeat

Note that the second yarn color of a group of three becomes the first and third yarn color of each successive group, but in a greater amount. The subtlety of the arrangement is a result of the combination of both sequences.

Majoro specimen 170465d alternates a White stripe $2\frac{1}{4}$ " wide with a 3-color band composed of Gray, Golden Brown, and Dark Brown (shown as Black in Plate XXXVI d):

BR GRAY BR GOLDEN BR GRAY BR GOLDEN BR GRAY BR GOLDEN BR GRAY BR
2 6 2 2 2 6 2 6 2 2 2 6 2 2 2

First note that two Dark Brown yarns regularly alternate with the others; then that the Gray and Golden Brown regularly alternate with each other in counts of 6-2-6; 6-2-6, breaking on the last group.

Cahuachi specimen 171183 is one of the rare examples of bisymmetric design arrangement among Peruvian textiles (Plate XXXVIa). The four colors are set up as follows:

GREEN-BLUE WHITE ORANGE WHITE ORANGE WHITE TAN (center), reverse order
6 2 2 2 2 2 6

The fifth cotton mantle fragment in this group, Cahuachi specimen 171311, is a 2-color check barred off at intervals of approximately two inches both warp- and weft-wise by a White stripe which forms a secondary design (Plate XXXVIc). The warp set-up of a single design unit is as follows:

WHITE BR TAN BR TAN BR TAN BR TAN BR TAN, repeat
4 2 16 2 16 2 16 2 16 2 16

The colors, including White and Natural Brown cotton, as matched to Maerz and Paul's printed samples varied in the different fragments as shown by the list:

"White" 12 B 6; 12 D 5	Gray 14 A 4
Natural Brown . . . 12 E 6; 13 E 7; 14 B 9	Orange 11 B 9
Golden Brown . . . 14 G 8	Green-Blue 39 E 1
Dark Brown 15 C 10; 15 E 11	

STRIPED WOOL MANTLES

Quite apart from the yarn composition, the striped wool mantles are differentiated from the striped cotton mantles by their more distinctive colorings, and complicated edge trimmings. In addition, they obviously represent a higher quality of workmanship than do the cotton mantles.

Two of the six specimens in this group are complete and furnish criteria of size, texture, and patterning by which to identify the fragmentary specimens. Since the complete specimens are very similar, it will be possible to describe them together.

	Cahuachi 171262	Cahuachi 171265
Length.....	60" (full)	48" (full)
Width.....	52" (full); 26" + 26"	38" (full)
Depth of edge trim.....	0.75"	0.375"
Weave.....	plain, warp stripes	plain, warp stripes
Warp-weft count.....	26 x 24 per inch	22 x 22 per inch
Yarn composition.....	single-ply and 2-ply wool	single-ply and 2-ply wool

The set-up for the warp stripes is similar in these two pieces (Plate XXXVIIe, f), and the yarns matched to the Maerz and Paul samples proved to be identical in color: Specimen 171262 has 6 Black yarns, 2 Rose yarns (5 L 7), 6 Red yarns (5 L 11), 2 Rose yarns repeated across its width; and specimen 171265 has 4 Black, 2 Rose, 4 Red, 2 Rose repeated. This is the familiar 1-2-3-2, 1-2-3-2, etc. repetition of the Peruvian color sequences. The crépy texture effect in both specimens is due to the fact that the 2-ply yarns are all spun hard twist, and the single-ply yarns are given crêpe twist. The Black yarns are "charred" to a degree that most of the stripes originally Black are now only spaces crossed by the Red weft yarns.

The two breadths of the larger mantle 171262 are either loom-joined, or seamed together by a method shown in Plate LXVII f. If the loom-join interpretation be accepted, then one completed breadth may have been held in place close to the second one under construction. Whenever the active weft yarn came across the second set-up of warps, it interlocked with an extra yarn put through the edge of the finished web with a needle. This procedure would draw together the edges of the completed web and the one under construction. If seaming by stitches was the method used, then credit must be given for almost incredible skill in putting the needle below a single edge warp of each breadth only, and through each weft loop. Perhaps such skill was not amazing in Early Nazca days, but it does so strike the modern analyst.

The edge trimmings are of two types on each of the mantles: a woven tape and a square needleknitted cord with rectangular tabs on one side and a fringe on its opposite side. Considering first the woven tapes, those across the two ends of specimen 171262 are woven tapestry fashion on set-ups of four warps, the wefts so closely battened down as to render the warps invisible. Upon completion, the outer edge warp of each tape was removed, leaving weft loops which twisted into a short fringe. The tape across the ends of specimen 171265 was woven tapestry fashion on three warps, all of which were left in place (Plate LXIV b).

The square cord with tab and fringe is one of the most complicated edge trimmings to be found among Peruvian textiles. Early Nazca weavers (or embroiderers, since the construction is wholly with the needle) seem to have favored this type of finish for wool mantles, and also for the wool kerchiefs. Wherever it occurs it edges the long sides and extends around the corners for a few inches (Plate XXXIV b). It combines three techniques, no one of which is difficult in itself: needleknitting,¹⁵ buttonholing or half-hitching for the tabs, and figure-8 weaving for the plain or fringed tape. The difficulty presented to the analyst lies in the fact that the widest fragment illustrating these three techniques in combination is only three-fourths of an inch wide (specimen 171125), and that each unit stitch is so small as to be seen only through a magnifying glass.

¹⁵ For an analysis of this technique see *American Anthropologist*, vol. 36, pp. 405-430, 1934.

Plate LXIV shows variations of the cord-tab-fringe (or tape) finish. The first unit, or foundation, is the square cord constructed on an indefinite number of colored wool yarns, one of which, usually Brownish-Black, makes the needleknitting stitches on two of the four sides (Plate LXVc). The stitches on the other two sides follow an apparent if not an actual sequence of colors. An example of the latter type is provided by specimen 171265, in which Yellow, Purple, Red, Orange, and White occur in the following sequence, imagining the four sides to be visible at the same time:

1	2	3	4	1	2	3	4
Y	Blk	Y	Blk	R	Blk	R	Blk
Y	Blk	Y	Blk	Y	Blk	Y	Blk
Y	Blk	Y	Blk	Y	Blk	Y	Blk
P	Blk	P	Blk	O	Blk	O	Blk
P	Blk	P	Blk	O	Blk	O	Blk
Y	Blk	Y	Blk	R	Blk	R	Blk
Y	Blk	Y	Blk	R	Blk	R	Blk

This sequence of fourteen courses is repeated with occasional breaks or substitutions of White for Yellow. The change from one to another color is possible because the whole group of colored yarns is carried along as a core around which the needleknitting stitches are made in this order: Red (or any one of the colors), Brownish Black, Red, Brownish Black, followed on the next course below by Yellow, Brownish-Black, Yellow, Brownish Black, and so on.

The second unit of the trimming is the tab series extending out from one Brownish Black vertical row of needleknitting stitches. Different specimens present variations in the number of buttonhole stitches in the single tab, and the direction in which the work proceeded, but these details are immaterial. Plate LXVd shows the method of piling up buttonhole stitches to form the tiny rectangular tab, two or three courses high, and Plate LXIVd shows the finished effect. The tabs completely conceal one dark side of the square needleknitted cord. Whipping stitches taken through the tops of the tabs fasten the trimming to the mantle or kerchief edges.

The tape or fringe edge, the third unit of the trimming, involves yarns stretched as warps. A weft is woven over and under these warps at the same time that it is made to pass under the needleknitted loops of the opposite dark side of the square cord (Plate LXIVe). There may have been a skeleton warp for the narrow tape on specimen 171265. Upon withdrawal of the skeleton warp the tightly twisted weft yarns curled. Or, there may have been several warps including a skeleton, as for specimen 171125 (Plate LXIVe). The weaving is in plain tapestry technique, in most cases figure-8 over two warps only. As shown in the illustration, three colors are used for weft. The multiplicity of colors in this last specimen suggests an extremely complicated technique.

Mantle 171310 is constructed of two breadths 22.5" wide (one complete, one fragmentary) seamed with saddler's stitches (Plate LXVIIc). It is a warp-face, striped material in three colors, natural White wool (14 L 10), Dark Brown (8 H 10), and Golden Brown (15 A 10), in the familiar sequence 1-2-3-2, 1-2-3-2, etc. Apparently the warps were deliberately set up in uneven widths since the stripes vary through $\frac{3}{16}$ " $\frac{5}{16}$ " $\frac{8}{16}$ " $\frac{10}{16}$ ".

The most interesting of the striped wools, and the only one exhibiting a range of colors, is a fragment 44" long (complete length) by 9" wide (specimen 170665, Plate XXXVIIi). It has a texture similar to veiling although the yarns are 2-ply instead of the usual single-ply found in such fabrics. The stripes are formed of groups of two or six yarns. The actual measurements of the wider ones vary because some of the warp groups have been set up more closely than others. Two Reds are used, the brighter one, Ember, for the two warps which alternate with all the other colors. The fragment is too narrow to determine the sequence

of colors, but two repetitions of them are as follows: Ember Red (5 K 10), Purple (47 E 5), Ember, Purple, Ember, Tan (11 C 3), Ember, Purple, Ember, Green-Blue (39 H 3), Ember, Indian Red (6 L 12). Repeat, substituting Orange (13 K 8) for Tan. The weft is Purple throughout. The colors, especially the Green-Blue, are very similar to Oriental rug colors.

Barred Wool Fragments, Unidentifiable.—Two small pieces of fine, open-weave materials, of a texture suggesting head veils, are represented by specimens 170211c¹⁻² (Plate XXXVIIc). They are identical in all but color: plain weave, count 18 warps by 18 wefts per inch, yarns single-ply wools. Specimen 170211c¹ has a set-up of four Barberry Red yarns (5 L 7) alternating with four lighter yarns composed of stock-dyed Rose fibers (3 K 8) and natural creamy wool. The wefts are the same in color and arrangement. Specimen 170211c² shows the same set-up of four and four, one set of yarns similar to Empire Green (23 E 8) and a second set which has completely dropped out of the fabric.

STRIPED MANTLE COLORS

Whether cotton or wool yarns were to be used in weaving, the choice seems to have fallen largely upon those within the dull Orange or Brown category. The range, matched with Maerz and Paul's printed samples, is extensive, although it may not have been so before the cloths were burned or faded by sun, and dulled by wear. The adjectives light, medium, dark in the following tabulation apply only to the Browns in the specimens under consideration. The darkest Brown in these striped pieces is, like Burnt Umber, many degrees lighter than Black.

Cotton mantles Specimen nos.	Brown			"White"	Reddish- Gray	Orange	Greenish- Blue
	Light	Medium	Dark				
170465b.....	.....	13 E 7	15 C 10	12 B 6	.....	.....	.....
170465d.....	.....	13 E 7	14 G 8	12 B 6	13 A 4	.....	.....
171183.....	12 D 5	14 B 9	.....	.....	.....	11 B 9	39 E 1
171305b.....	12 E 6	.....	.....	12 B 6	.....	.....	.....
171311.....	12 E 6	13 E 7	15 E 11	.....	.....	.....	.....

The wool mantles in this small group are more colorful. Brown wool yarns were used in some garments, for instance, the tunics, but only one of the four mantles is woven with brown yarns. Disregarding the colors in the trimming bands, which will be noted when speaking of the needleknitting specimens, the dyed yarns of the basic webs strongly contrast with those in the cotton webs, probably Natural Brown in some cases.

Wool mantles Specimen nos.	Red	Orange (Brown)	Yellow	Green	Blue	Purple	Black
170665.....	5 K 10	13 K 8	11 C 3	39 H 3	.....	47 E 5	.....
	5 L 11	.....	.....	.....	.....	.....	.....
171262.....	5 L 7	.....	.....	.....	.....	.....	Present
	5 L 11	.....	.....	.....	.....	.....	.....
171265.....	5 L 7	.....	.....	.....	.....	.....	Present
	5 L 11	.....	.....	.....	.....	.....	.....
171310.....	.....	8 H 10	.....	.....	.....	.....	.....
	.....	14 L 10	.....	.....	.....	.....	.....
	.....	15 A 10	.....	.....	.....	.....	.....

BROCADED AND EMBROIDERED MANTLES

The most obvious feature of the small group of mantles coming under this classification is that no two of them are similar in design or in patterning, only in coloring. Among them is Cahuachi mantle 171220, a specimen of such importance as to warrant detailed treatment of its several features.^{15a}

^{15a} A detailed discussion of this specimen appears also under the title *The Wide-Loom Fabrics of Nazca, Essays in Anthropology in honor of Alfred Louis Kroeber*, Berkeley, 1936.

Mantle 171220 is represented by three large and two small fragments:

Aj10-171218a.....	38"	x	48½"
Aj10-171219a ¹⁻³	20½"	x	40", 12" x 18", 3½" x 7"
Aj10-171220.....	26"	x	33"

For convenient reference within this section of the paper only, the three fragments of 171219a have been given superior numbers, but in speaking of the garment as a whole it is referred to by the last of its numbers, 171220 (Plate XXXIII).

The five fragments, four of which are corners showing loom-string ends and side selvages, fit together to form a rectangle at least 6'8" long by 5'5" wide (Plate XLIX). If more evidence than the reconstructed shape were needed to prove that the remnants were originally one web, the similar yarn counts per inch, the identical design motives, and the colors of the decorative yarns could be cited. There is no doubt of the full width measure since there is no suspicion of lengthwise join. The two fragments 171218a and 171220 fit together with no inch of the fabric missing. Straight tears warpwise and weftwise through one of the rectangular design motives leave portions of it on both fragments. In addition, there are the same dark and yellowish stains on both fragments.

Any opinion concerning the loom type upon which a 5'5" breadth was woven must be speculative. No one has made a detailed study of the ancient Peruvian artifacts which might be interpreted as loom parts. The direct and indirect evidence to date indicates that the looms were of the type attached to the weaver's belt,¹⁶ but a belt loom for a single weaver seems a most dubious explanation for a single breadth 5'5" wide, and a totally inadequate one for two single-breadth Paracas fabrics 7'7" and 8'3" wide in the Museo Nacional collections in Lima.¹⁷

The main reasons why the ordinary belt loom type manipulated by a single weaver seem improbable explanations for wide fabrics like the three mentioned concern the limitations imposed by the loom itself. A weaver sitting at the center of a loom bar attached to her waist can weave a fabric very little wider than the length of her reach to right and left. She can, it is true, sway to each side, but the distance is limited by her position in the belt contrivance. Before she can enter the weft yarn at either side, the alternate warps of the set-up must be raised by some form of heddle. The kind found in the prehistoric graves is a type known in different parts of the world. It consists of a stick as long as the warp set-up is wide—this length is for fabrics of average width—from which cord loops drop to encircle each of the odd or even warps.

A heddle stick 5'5" long with loops encircling the alternate warps would be no easy object to raise, especially since it should be inflexible, therefore of some weight. To envisage raising the whole group of encircled warps against their resistance, at the same time putting through the space so created a sword or batten to keep them separated, these two actions with the body tense, taxes the imagination of a modern craftsman. A sword at least 5'5" long, and of sufficient weight to be effective, could not but be unwieldy. I doubt if one person could manage both heddle and sword if they were as long as the Cahuachi set-up was wide. Perhaps, like the heddles on the looms for weaving pictorial tapestries, the Cahuachi heddles were in sections. And, perhaps, the swords were short and were pushed through the shed as the sections of the warp were raised by the heddles.

To put the weft across a wide web is slow work but not difficult. Wound sticks, or spindles, and balls of weft yarns have been found. In either form the weft yarn is not a

¹⁶ Textile Periods, p. 29, footnote 14.

¹⁷ E. Yacovleff and J. C. Muelle, *Un fardo funerario de Paracas*, Revista del Museo Nacional, vol. III, nos. 1-2, pp. 77, 79-80, plate 1e, f, 1934.

problem. But battening each line of weft down to the already woven cloth depends again upon the length and type of sword.

Maintaining even side selvages, a feature of all Peruvian weaving of whatever period, would also give trouble to the weaver working at a 5'5" breadth. Most modern craftsmen pull through the weft with one hand, at the same time holding with the other the opposite edge to prevent it from drawing in. To stretch across a set-up of 5'5" demands the full reach of a weaver of that height, and to make cloth by repeating the motion 26 times an inch for 6'8" seems pretty improbable. For the 7'7" and 8'3" materials reported from Paracas mummy bundles, a single weaver at a belt loom is an impossible assumption.

Since any opinion to date regarding the loom type is speculative, one might imagine a loom at which it was customary for several weavers to work side by side as they did when weaving the Kashmere shawls, or as they do today in weaving the Oriental rugs. Then, too, there is always the possibility that the Early weavers had wide looms similar to the horizontal or the vertical frames in use today among certain African tribes. Possibly, like the ancient Egyptians, the Peruvians used both types and set two weavers at each.¹⁸ The Lima investigators quoted above suggest "some form of large loom whose models have not come down to us for the reason that it was impossible to place the looms in the graves."

An analysis of the length measurement of the Cahuachi mantle and the reason behind the assumption that 6'8" is the minimum also involves uncertainty. Specimens 171218a and 171219a¹ are opposite corner pieces on the same side, and although the embroidered motives bordering the ends are different, the side borders are identical (Plate LIIc). The same sequence of four colors in the two halves of the design unit—(1) Blue, Green, Yellow-Orange; (2) Blue, Green, Red—is maintained through two complete repetitions, or four half-units, from the corner of specimen 171219a¹. The cloth has disintegrated under the last two motives, leaving long loops of the Green yarn still interlocked at the change from Green to Red (Plate LXVIIIe), and the few remaining Red loops are only a fraction of their original length. On the other side of the break the sequence picks up at Blue and continues: Blue, Green, Red—the second half-unit of the repetition—and then unbrokenly to the corner of specimen 171218a where the sequence ends on Blue. In numerals, to represent Blue, Green, Yellow-Orange, Red, the sequence is as follows: 123-124; 123-124; cloth missing—124; 123-124; 123-1.

A determination of the original length of this mantle depends upon two factors in the analysis: the approximate length which seems in reasonable proportion to a mantle width of 5'5", and the clues furnished by the measurements of the border motives. These last are perhaps more tangible and may be considered first.

Peruvian color sequences are in most cases consistently maintained. There is no reason to suppose that the destroyed portion of the original mantle between what is now represented by specimens 171218a and 171219a¹ was any exception to that rule. There is no reason, either, to suppose that the lengths of the three embroidered elements in each half unit, totaling approximately 8½", should have appreciably varied in the missing portion. The mantle's total length would, then, have been equal to the fragmentary border lengths, 33½" (which includes the length of the fragmentary Red element, 3") and 38" plus the first half-unit of the sequence, the missing Blue, Green, Yellow-Orange motives, approximately 8½", total 80". This is the minimum length. Of course, there is no arbitrary limit to the suggested length, but if the original mantle was longer than 6'8" then the amount must almost certainly have been governed by the combined lengths of the two half-units in the border, approximately 17"-18". In other words, adding 11½" to the lengths of the

¹⁸ H. Ling Roth, *Ancient Egyptian and Greek Looms*, figs. 1-11, 13, 14, 16, Halifax, 1913.

two intact borders provides for completion of the fragmentary Red motive and for the missing half-unit, Blue, Green, Yellow-Orange. Any alternative interpretation requires that whole units, each measuring 17"-18", be considered in addition to the 11½" which fills the gap in an otherwise perfect color sequence.

From the standpoint of proportions, there is less material upon which to base estimates concerning the length of the original mantle. The Early Nazca collection contains ten mantles furnishing complete dimensions. Their lengths, ranging from 40" through 80" (?), and their widths, from 38" through 65", are tabulated in the section on Mantle Dimensions (Table 22).

If we assume the original dimensions of mantle 171220 to have been 80" (33½" + 38" + missing half-unit, 8½") by 65", the proportion of width to length is 0.812, placing the mantle third in the group of ten. If, however, we assume the original dimensions to have been 97" (33½" + 38" + missing half-unit, 8½", + a complete unit, 17" +) by 65", the proportion of width to length is 0.67, first on the list. There is, in reality, no more foundation for one than the other assumption, except that the available mantles show lesser rather than greater differences between their two dimensions. It may be of interest at this point to note that the Cahuachi mantle seems to have conformed to a local style in the matter of proportions. The celebrated embroidered mantles from the Paracas Necropolis representing a period approximately coeval in time¹⁹ are not only unlike the Early Nazca mantles in the Field Museum Collection in general appearance and decoration, but also in dimensions. A summary of three basic tables is here presented:²⁰

Range in lengths of 67 Paracas Necropolis mantles: 83"-144".

Range in widths of 53 Paracas Necropolis mantles: 31"-64".

Range in proportions of widths to lengths of 53 Paracas mantles: 0.242-0.605.

Even assuming a length measurement for mantle 171220 which would place its width-to-length proportion first in its group does not alter the fact that the Paracas mantles radically differ in shape from the available Early Nazca examples.

Technologically, Cahuachi mantle 171220 presents few unusual details. The basic weave is plain, and the texture has something in common with modern scrim except that the more tightly twisted yarns of the mantle account for a slightly crêped surface. The warp-weft counts per inch vary sufficiently to indicate that hand weavers are pretty much alike in all times. The warps were set up 26, 28, and 30 per inch. Wefts count 24 and 26 per inch. The yarn is 2-ply white cotton, spun medium-to-hard twist.

This Cahuachi mantle, like so many other textiles in Peruvian collections, brings up the ever-recurring question of whether a certain technique shall be classified as brocade or embroidery. The answer is made no easier by references to older writings in which are described brocades worked with the needle, as well as embroideries accomplished in the loom. Either description confuses by reason of the fact that brocading has been more or less firmly established as a weaving process, and embroidery has for ages been restricted to a method of patterning a fabric already woven. With the best intentions two English writers seek to clarify the situation in the following paragraph:

"Many of the Peruvian patterns are woven by the method of brocading. This closely resembles a simple form of embroidery, and it is sometimes difficult to determine the one from the other, brocading being really a form of embroidery applied to weaving. In brocade weaving, the threads forming the pattern are inserted as an addition to the weft threads

¹⁹ Textile Periods, p. 25, Table I, Chronological Concordance of Periods.

²⁰ Unpublished MS.

and in a line with them during the course of weaving, and this is done with a needle or some form of bobbin, the warp threads being so regulated in their use as to secure the brocading threads somewhat slackly at certain defined points in the pattern without themselves being evident; there may be a special warp for this purpose. The brocading is therefore part of the process of weaving, but it has not the structural element of tapestry. The same process carried out by the needle on the woven fabric is true embroidery."²¹

The description is accurate and also adequate, if two details be added: first, that the threads forming the weft brocade pattern regularly alternate wherever used with the weft threads of the basic material; and, second, that the "certain defined points" at which the warp threads appear often in themselves make a secondary pattern on the brocading threads as well as "secure" them.²²

In the analysis of these Cahuachi mantle fragments for the preliminary report²³ the borders and rectangular motives were termed brocades. It is true that the basic fabric is a fairly coarse open-mesh material, and to count its threads in order to plan the geometric elements in the patterns implies no such skill as do other Peruvian techniques of this Early period, the needleknitted bird and flower fringes, for example. But, if one inclined to interpret mantle 171220 as a brocade, one might argue that the straight-line work of the pattern rectangles could be put in more easily with a shuttle weaving over and under stretched bare warps than with an embroidery needle subsequent to the weaving. This reasoning assumes a knowledge of what the Cahuachi weaver considered easy or convenient. And, too, if one of the heavier pattern yarns was never found to cross a basic weft which parallels it on either side, the brocade interpretation could stand against any argument for embroidery. Perfectly done, embroidery in the brocade manner cannot be distinguished from brocade. The smaller motives which form the lower borders, the finial motives out from the corners of the rectangles, and the side borders with their yarns interlocking at color changes do not bear the stamp of the brocade technique, although it is conceivable that they might have been made by that method.

The patterning of Cahuachi mantle 171220 is not the least interesting of its features. There are seemingly illogical differences in the four borders, inconsistencies in the arrangement of design forms, and unanswerable questions arising as to the original size of several fragmentary motives. Added to these aspects—and largely because of them—is the regrettable lack of actual evidence for the patterning of the missing center third of the mantle.

Plate XLIX shows schematically the proportions of the reconstructed garment, the placing of its various design areas indicated by capital letters. Each area is a composite of elements more or less similar in appearance, but not identical. The characteristic simple and elaborated elements forming the motives are the following:

(1) Lozenge shapes: plain 4-sided diamonds of various sizes, with and without embroidered center dots (Plate Lb); angular figure-8 forms composed of two lozenge shapes, and elaborated lozenge shapes with wide framing lines and hexagonal center dots (Plate La).

(2) Triangles: isosceles and equilateral, both with and without embroidered center dots (Plate Lb).

(3) Chevrons: small simple forms as well as elaborated ones (Plate Lb).

(4) Bird forms: in flight, profile view; in flight, top view (Plates LI, LII); four heads (?) radiating from horizontal axis, and two heads (?) in profile, bodies forming sides

²¹ Mary Symonds and Louisa Preece, *Needlework Through the Ages*, p. 108. London, 1928.

²² *Textile Periods*, plate 23b, shows warp shedding for secondary design.

²³ *Idem*, footnote 16.

of chevron (Plate La); bird (?) form with short tail feathers and very long tail feather (?) turned back under body (Plates LI, LII).

(5) Serpent forms: the bodies a composite of lozenges and triangles (Plate Lb); highly conventionalized form, possibly serpent (Plate LIIc, d).

These design elements are variously combined in forming ten different border and basic web motives, each of which requires a separate description. The letters correspond to those on Plate XLIX.

(A) A border on one long edge (specimens 171219a² and 171220) composed of 2½" to 3" units with half-inch spaces between them. Each space is broken by the bill of a bird in profile; alternate birds face in the same direction, a method of countering which seems never to have been practiced to any extent during the known Peruvian periods (Plate LIIId). Colors in repeated sequence, as given above: Blue, Green, Yellow-Orange; Blue, Green, Red. There is little doubt that the rectangular unit as well as the bird form is in embroidery technique. The mantle edge is thickened where several strands of wool yarns have been crowded in between the basic warp threads. The motives are all more or less alike, but what they were meant to represent is not clear. Perhaps they are double-headed serpents, a form to be seen in two of the large rectangles in the center of the web (Plate Lb). Wherever the color change takes place, the individual embroidery yarns of the two involved sets interlock underneath the space occupied by the bird form as shown in detail drawing Plate LXVIIIe, f.

(B) A border on opposite long edge formed by specimens 171218a and 171219a¹. In color sequence and other respects this border is identical to border A except that the bird figures which fill the spaces between the rectangles are represented full top view instead of in profile (Plate LIIc).

(C) An end border on fragments 171219a² and a³. Plates LIb, LIIe show the form and arrangement of a design element which may or may not be a bird. Note the apparent lack of system in either the arrangement of the motives in relation to each other, or in their relation to the border as a whole as evidenced by the sizes, spacing, and countering of the design parts. The small birds near the corner are equally illogical. Did the embroiderer begin with these and finish with the more ambitious motives? Or did she weary of doing the larger motives, and end off the row with the small birds as fillers?

(D) An end border on fragment 171219a¹ (Plate LIa). Profile bird forms in zigzag arrangement, the bill of the upper bird forming the leg of the lower bird, and vice versa. At the corner end of the border, and for no obvious reason based upon spacing, there is a single element identical to the motives in end border C.

(E) An end border on fragment 171218a, a second arrangement of the bird motives of border D in a double zigzag which drifts off without reason into a pair of the same motives used alone in border C (Plate LIc).

(F) A free standing motive, animal (?) or fish (?) on end of fragment 171219a¹ (Plate LIIa). In solid color, Blue.

(G) Rectangular motives in main web, complete in specimen 171218a and partially complete in 171219a¹. The individual elements of this design are lozenges, triangles, and chevrons, so arranged as to form double-headed serpent forms. The stitchery (?) in all the rectangular motives is parallel to the weft yarns, giving the effect of woven brocade (Plate Lb). The colors, Red, Green, Yellow-Orange repeated 1-2-3-2, 1-2-3-2, 1-2-3, appear as lengthwise stripes on the Blue ground of the motive.

(H) Rectangular motives, portions of which appear in specimens 171218a, 171219a¹, and 171220. The rectangles are approximately the same size as those described under

G, but the basic elements are differently combined. In addition, each corner is extended by a zigzag line terminating in a bird form (Plate La). The same stripes of Red, Green, and Yellow-Orange yarns run lengthwise through these motives as in the G type. Birds Red and Green on opposite diagonal corners; in Blue and Yellow-Orange on remaining two.

(I) A finial in the form of a bird extending out from the corner of a missing design motive. The original shape of the motive cannot be determined. The distance between the finial and the basic web of fragment 171220 is too short to allow a rectangle as large as those lettered G and H. There is no clue to the main design motive except that the bird is embroidered in Red and Green as in H type.

(J) A motive of unknown size and shape on fragment 171220 (Plate LIIb). Here there is space for a form similar to the rectangles lettered G and H, but the bit of intact embroidery is unlike either, although apparently composed of some of the common elements.

The one constant factor in the patterning is the limited range of colors used. If mantle 171220 showed fewer signs of fading, the number of hues might be analyzed with greater certainty. The yarns matched to the printed samples in Maerz and Paul's Dictionary of Color yielded the following results: Bronze Green (16 L 12), two Yellow-Orange hues similar to Raw Sienna (12 J 9 and 13 L 9), two dark Blues (39 H 3 and 40 H 10), a Brown similar to Chestnut (7 H 9), the familiar Brickdust (5 L 11), and perhaps several other Reds which at this time look like faded yarns. Upon analysis it has been found that the Peruvians had dyes to produce a wide range of Reds, but in this particular case it seems wise to stop with the one Red which is certainly present. Many of the yarns in mantle 171220 show strands differing in color, and it is doubtful whether matching an assortment of swatches would mean very much. The impression given by the whole mantle is of embroidered motives in Red, Blue, Green, and Yellow-Orange, with occasional small areas in dark Purplish Brown. The repetition of a series of these colors is nowhere insistent except in the two side borders, A and B, but it does make itself felt as a deliberate repetition.

Cahuachi mantle 171220 presents a number of features common to the Early period fabrics as we know them: the cotton basic web with a pattern in wool; the bold designs, no doubt conventionalized and affected by local tastes, but not rendered meaningless through slovenly handling; the strong rich colors of the dyed yarns, the whole general effect of a garment woven and embroidered by craftsmen who were aware of involved techniques, but who had them under perfect control. This is evident in the evenly spun yarns and the uniform surface texture of the material.

Majoro mantle 170465a is a fragment of incomplete length, but full 37" width. Needle-holes on its side selvage indicate that a second breadth was originally seamed to it. The weave is plain, warp face, and the yarn count varies in the three selected spots 52 x 32, 58 x 36, and 64 x 30. An arbitrary choice of 58 x 32 was made for Table 20.

The embroidery is a combination of double running and stem stitch. One side edge, the outer in the original garment, has a band of animal figures (llamas?) with short legs, approximate overall measure of 1" long by 1/2" high (Plate LVIIe). Extending from the corner across the loomstring end for 6" are two rows of birds (?). The yarn of the basic material is 2-ply white cotton. The embroidery is done in 2-ply wools: Purple, of two hues similar to Mauve (46 : G4 and 46 : D6, both colors characteristic of the textiles of this collection), Rose (4 E 10), and Yellow-Green (24 L 1). The colors appear in no regular order except that the two Purples occur together twice, making dark blocks in the border.

The question whether the specimen is embroidered or brocaded is not raised by this mantle since the extra yarn is put in parallel to the warps on both side and end. Wherever

the colors change the embroidery yarns loop about each other as in mantle 171220 (Plate LXVIIIe). The designs are built up by floats over 2, 4, or 6 wefts, and the stitches are so arranged as to give a flat twill effect to the face of the embroidered surface.

Cahuachi mantle 171216 is chiefly interesting because of the unusual number of colors brought into its design motives. It is a complete piece, 57" x 47½", in plain weave; warp-weft counts 28 x 34; 2-ply white cotton for the basic web, single-ply and 2-ply dyed wools for the embroidery (Plate LVIII).

The surface and reverse sides of the mantle are identical. The stitch is the same double running stitch mentioned above, but this time used alone (Plate LXh). Double running is essentially like weaving in that the needle passes alternately over and under a definite number of warps or wefts—in this mantle three of either—when progressing in a given direction. On the return, progressing in the opposite direction, the same number of basic web yarns are passed over and under, but in reverse order, so that if warps 1, 2, 3 are passed over the first time, on the return they are passed under by the embroidery yarn. The difference in the direction of the stitch, whether made parallel to the warps or to the wefts, varies the surface effect. The work appears to be solid embroidery, although the lines of wool stitchery are separated by a single cotton yarn of the basic weave. Curves and diagonal lines are built up as in weaving by stepping the embroidery stitches to right or left.

Each corner of mantle 171216 contains a human figure holding a staff or weapon in either hand. The figures are about 4½" tall, the length of each parallels the weft yarns, and each is divided into approximately the same larger areas of color: face, body, head-dress, tunic, breech clout, staves. The faces are represented with painted markings.

At least fifteen colors are involved. Some of the figures and even the details were originally outlined with dark yarn, probably as near Black as was obtainable. All these outlines are either completely disintegrated or remain in the fabric as bits of charred yarn. The mouth and eye details also were probably in blackish yarns since they have fallen out of the material. The greatest number of colors are used in the head-dresses and the staves. One figure has a head-dress embroidered in checks of eight colors; another carries staves divided into ten small color zones. Most of the yarns are still bright, and fifteen were matched to the printed samples in Maerz and Paul's Dictionary of Color with the following results:

Reds: 3 J 9, similar to Coral; 4 G 10, similar to Etruscan; 5 L 11, Brickdust.

Yellows: 10 J 5, Corn; 10 K 6, Chinese; 13 L 9, similar to Hazel.

Greens: 22 J 1, similar to Reseda; 23 E 5, similar to Cedar; 24 A 6, dark Yellow-Green; 24 E 11, similar to Hunter Green.

Blue-Greens: 38 J 3, 40 H 9, and 40 J 6, similar to Navy.

Purples: 44 B 2, similar to Heliotrope.

Purple-Reds: 56 C 5, similar to Burgundy.

Cahuachi mantle 171222 is represented by two large fragments 20" x 41½" (full width) and 28" x 26" (Plate LIXa). Thanks to the maintained color sequence of the embroidered motives, it is possible to fit together the two pieces and to determine the complete size, 50" x 41½". The mantle is plain weave, with warp-weft count 28 x 24 per inch, of 2-ply brown (?) cotton, crêpe twist. The allover pattern of open flowers, 5" x 3", is done with fine single-ply wool yarns. The technique employed gives the motives the appearance of having been set into the cloth. The stitch is the well-known "tent stitch," spaced. According to the usual method of making a line of tent stitching the embroidery thread passes over each intersection of warp and weft, missing none. In the Peruvian variety as exemplified by mantle

171222, the embroidery thread passes over alternate intersections of the warps and wefts: over one warp-weft crossing, under one, over one, etc. (Plate LIXb). When, in the next line to be worked, the warp-weft crossings missed are passed over by the embroidery thread, the slanting stitches form diagonals within the motive illustrating the secondary design type of patterning of which the ancient Peruvians were so fond.

Plate LIXa shows the shape of the design motive and the sequences of colors in flower shapes and center dots. The yarns matched to the printed color samples²⁴ are the following:

Flower		Center Spot	
1.	Red, 5 L 9.....Purple	6.	Yellow, 12 L 9.....Green
2.	Purple, 46 D 2.....Yellow	7.	Light Blue, 39 H 3...Light Red
3.	Light Green, 14 K 1.....Red	8.	Red, 5 L 9.....Blue
4.	Light Red, 4 G 10.....Light Blue	9.	Blue, 40 H 5.....Yellow
5.	Green, 31 C 7.....Yellow		

The Purple, 46 D 2, is slightly brighter than the hue known as Mauve Dust, and forms one of the small group of Bluish-Reds previously mentioned as noticeable in any amount because comparatively rare. In mantle 171222 the areas developed in Mauve are unusually large.

An embroidered edge trimming, Cahuachi 171180d, belongs in this group on the basis of its technical features. Its appearance is similar to the needleknitted band with tabs and fringe which is applied to Cahuachi mantle 171309. The embroidered fragment is about 1½" wide plus a 2" fringe (Plate LVIIc). The foundation fabric is woven of 2-ply wool yarns, warp-weft count approximately 30 x 30 per inch. This foundation is almost covered with stem stitch embroidery of fine quality. The motive is the Nazca open flower worked in five or more colors, most of them faded or discolored.

One side of the band is edged with close-set rectangular tabs about ¾" deep. These are built by working rows of blanket stitches (coil without foundation) back and forth across the width (Plate LXVa). The stitches are so small that the fabric has the appearance of having been woven. Tabs made in this fashion are frequently found on fabrics from Early Nazca and Paracas sites. They are described in the section on Mantles with Needleknitted Edges as foundation shapes for needleknitting embroidery.

The fringe on the opposite side of the embroidered band was added by weaving between the outer warp of the band and a removable skeleton warp about 2" distant. This type of fringe is characteristic of the period.

MANTLES WITH NEEDLEKNITTED EDGES

Needleknitting is a term coined to describe the appearance of an embroidery stitch.²⁵ By means of this technique the Early period embroiderers of Nazca and Paracas constructed edge trimmings from simple bindings to complex three-dimensional passementeries. The best-known example of the latter type is the celebrated Larco-Herrera textile from the Necropolis at Paracas.²⁶

An analysis of the five mantle specimens upon which needleknitting is found reveals its range of possibilities. Two of the mantles are colored: 171112 Bluish-Black and 171309 Dark Green (16 E 3). The dimensions of the only two complete garments (171223a, 171224) show them to have been almost square (Table 20). The pair of 25" widths for each are seamed together with tiny stitches taken through each turn of the wefts on the side selvages,

²⁴ Dictionary of Color.

²⁵ Textile Periods, p. 32, footnote 25.

²⁶ J. Levillier, Paracas, A Contribution to the Study of Pre-Incaic Textiles in Ancient Peru. Paris, 1928.

a process which may or may not have been done at the time the second breadth was in the loom.²⁷ The Bluish-Black mantle, 171112, which looks like a veil or turban, is included in this group for the reason that there are too few similar examples to justify subdivisions.

All five mantle specimens are plain weave cottons, generally of finer quality than that of any of the other groups, as has already been noted in the section on the Correlation between Mantle Types and Yarn Counts (Table 24).

With the exception of the embroidered edges the mantles within this classification present no distinctive features. Each has a needleknitted edge of wool yarns in a wide range of colors. For the present, it will suffice to say that typical needleknitting was developed in from four to a dozen or more colors. The variety was made possible by the freedom from technical limitations such as were imposed by the loom, and by the fact that short bits of yarn could be employed advantageously. Any generalizations regarding Early Nazca conventions or tastes as shown by color choices must be based upon comparisons and occurrence frequencies. These can best be presented at the end of this section in a summary.

The motives developed in needleknitting technique by the Early Nazca embroiderers, to judge by the available material, were relatively few: birds of the parrot and humming bird types, full-blown flowers, plant and seed (?) forms, faces, and the stepped fret. The bird and flower motives seem to have been suitable for representation, either flat like plain embroidery, or in three dimensions.

Following is a brief résumé of the needleknitted details on mantles in the collection. Three of the five have fringes representing birds on a "branch." The fringe sewed to Cahuachi veil or mantle 171112 may be taken as a characteristic specimen (Plate LXIf). In this fragment, $1\frac{1}{4}$ " wide, plant forms originally alternated with birds' heads. At intervals within the length of the branch there are colored motives representing bodies and three-toed feet. A dozen different colors may be identified, not counting those which are interpreted as faded hues.

The fringes on specimens 171223a and 171237 are similar to the above except that the $\frac{3}{4}$ " width reduces the size of every detail (Plate LXIIa), yet the number of colored yarns employed is 12 and 14. Originally there were flower or plant forms between the birds of the latter specimen as indicated by the remnants below the "branch."

Mantle 171224 illustrates one of the many discovered variations of the needleknitting technique. The fragment is 50" long, the complete length. A Red and Purplish Black striped trimming band, approximately 2" wide, remains sewn to one of the side edges (Plate LXIa-c). The set-up allowed for a center space as follows: warps for $\frac{3}{4}$ ", $\frac{1}{2}$ " space, warps for $\frac{3}{4}$ ". The wefts crossed the space, thus providing a foundation over which to work the needleknitting. This was done on both sides of the bare wefts, making the band reversible except for the fact that birds' heads rise up from it on the surface side. The realistic effect is heightened by the open bills in Yellow stitchery and the lines on the needleknitted band representing tail feathers.

Cahuachi mantle 171309 is a folded bundle of material too charred to open out to measure. The fringed edge trimming illustrates one of the familiar uses of the needleknitting technique. The stitchery veneers a woven foundation tape 8 warps wide. On one side of this veneered band are small tabs in needleknitting made over a foundation of buttonhole stitches, on the opposite side a fringe (Plate LXId). The loops forming the 2" fringe were made by weaving yarn from the needleknitting stitches on the lower edge of the tape over and under three warps, two of them close set, the third one the required distance from the

²⁷ Textile Periods, p. 30, footnote 15.

other two. This skeleton warp was subsequently removed, thereby allowing the weft loops to twist tightly. Many Peruvian specimens are edged with fringes woven in this manner. Most of them are separately made and joined to the garment.

UNIDENTIFIABLE FRAGMENTS

Besides those already described, the collection contains a number of fragmentary specimens of needleknitting. Some are similar to the bird and flower fringes, and some are included in this section on mantles only because they have more points in common with the mantle edge trimmings than with those on any other of the garments in the collection. The group, more or less unidentifiable as to original use, falls into four classifications:

(1) Bird and flower fringes, presumably the edge trimmings of mantle, veil, or turban types, $1\frac{1}{2}$ "–3" wide.

The fragments within this first category are very similar. Trancas fragment *9058 ($2\frac{3}{4}$ " wide) consists of a needleknitted tubular "branch" along which humming birds alternate with open flowers (Plate LXIIb). The latter are realistic. They have centers, petals, and stems in solid colors and stripes, but no two flowers are alike. The birds' forms are similarly divisioned into color areas of eyes, throats, breasts, wing and tail feathers. There is apparently no planned arrangement of the colors in any of these intricate passementeries. The hues, several of each family, range from light to dark, and through various degrees of grayness.

The above description will do in a general way for Cahuachi specimens 170211a, 171113, and 171180a. All are fragments ranging in length from 3" to 6". As the summary will show, the number of colors varies, but the bits of each are so small as to make all flower-bird fringes look alike except for size.

(2) A stalk with blossoms and leaves (specimen 171114) probably was part of a fringe trimming (Plate LXIIe). It is more elaborate in its detail than the bird and flower motives, but shares the same general characteristics: realistic rendering of design units within the limits of a technique which cannot avoid being bulky, and the division of the units into small color areas.

(3) Flat, veneered tapes with fringed and tabbed edges like those of mantle 171309 are represented by five specimens. Cahuachi 171180b¹ is a fragment about $1\frac{1}{2}$ " wide (Plate LXIIg). It consists of a woven tape, and tab foundations covered on all sides with needleknitting. The foundation fabrics have disintegrated but the assumption that they were part of the piece in its original condition is based upon their presence in similar and better-preserved specimens. The design motive in the band might be one of the numerous bird-form abstractions.

The second specimen of a veneered tape, 171117, is an unusual example (Plate LXIg). Geometric motives seem rarely to have been developed in needleknitting. This fragment has pairs of interlocking stepped frets approximately $1\frac{1}{2}$ " long, each in a different color. The piece is too small to indicate whether or not a repetition of the colors was carried out. The $\frac{3}{4}$ " fringe is made as described for mantle 171309 above, by weaving a yarn from the lower edge over and under three warps set close to it, and a fourth skeleton warp the desired depth of the fringe distant from the others. The skeleton warp is withdrawn upon completion of the weaving.

The remaining three specimens in this category, fragments 170211b, 171116a, and 171321a are all flat, veneered tapes with tab edges (total width approximately $1\frac{1}{2}$ ") (Plate LXII f, h). The motive in each is the favorite flower-bird combination. The first specimen still shows two intact humming bird forms, tail feathers spread, bills in an open six-petal flower. The colors of the yarns are dimmed due to the bad condition of the specimen. The

second piece is in even poorer condition, but remnants of flowers and feathers indicate the familiar arrangement. A dark outline on the tabs of specimen 171321a may be a bird form.

(4) Needleknitted ornaments in the form of small squarish human heads (approximately $1\frac{1}{2}$ " by $1\frac{1}{2}$ ") may originally have been part of a decorative edge (Plate LXI*h*, *i*, *j*). There are seven in the group, three badly charred: Cahuachi specimens 171115, 171180b², 171321b¹⁻⁵. The faces of the better-preserved specimens are Red, with features and paint marks in Yellow, Green, and Blue yarns outlined with Black. The rectangular noses are in bold relief, and remnants of "hair" are indicated by long figure-8 stitches across the foreheads of two specimens. Each head is embroidered in fine needleknitting stitches over a cotton foundation. The surface and reverse sides of each are duplicates except for some deliberate interchange of colors.

COLORS IN NEEDLEKNITTING SPECIMENS

After amazement at the intricacy of detail in a needleknitted specimen, one's next reaction is to the minute bits of color which appear and disappear in the motives. Then one begins to count. The task does not yield a satisfying scientific result because some of the colors have faded to hues which have counterparts in unfaded yarns: Reds became Golden Browns; Green lost its Blue and became Yellow; and Black most often is Red, Purple, Green, or Brown when matched with samples. Embroidery in Early Nazca times, and this includes needleknitting, makes obvious the fact that the kaleidoscopic effect given by many small areas of color was desired. One type of woven fabric, the multi-colored patchwork, likewise lent itself to the same effect, and by reason of it claims aesthetic as well as technological interest.

The colors listed below are those found among the needleknitted specimens. They have already appeared in the various color charts (Tables 3 to 19), and form part of whatever computations were based upon them. The notation follows that of Maerz and Paul's Dictionary of Color in indicating plate, column letter, and row number of the printed samples matched by yarn swatches.

The tabulation makes evident that the Early Nazca embroiderers were aware in combining colors of the effect of certain values and degrees of purity. They must have been conscious of the fact that the Orange-to-Yellow hues are bright and sparkling in their light values, but appear muddy as they are darkened and grayed. They apparently did not favor the light Reds and Pinks, to judge by the great preponderance of medium and dark hues. And when they chose to use yarns coming within the groups from Yellow around the circle again to Red, they restricted themselves largely to closely related Yellow-Greens (Plate 23),²⁸ Blue-Greens (Plate 39),²⁸ and the grayed Purples, previously mentioned as noteworthy. These tendencies argue for as well-established predilections for certain colors as we ourselves entertain. The involved specimens are from only two sites in the same valley, but represent finds from six graves.²⁹ They constitute a fair sample by which to judge the characteristic use of color in a single fabric type.

²⁸ See Table 26, footnote †.

²⁹ The graves represented are Nazca, Cahuachi III, Ag, Aj10, Aj11, A15, Ha. The Trancas specimen, *9058, is a surface find.

TABLE 26
RANGE OF COLORS IN NEEDLEKNITTED SPECIMENS†

Color Groups	Light Hues	Medium Hues	Dark Hues, Black‡
Red-to-Orange: Plates 1-8	4 J 10	5 K 3 5 K 5 5 K 6, Crimson± 5 K 10, Ember 5 L 7, Barberry 5 L 9 5 L 11, Brickdust	6 D 11, Ginger±* 8 H 2 8 L 7 8 L 9, Chocolate±
Orange-to-Yellow: Plates 9-16	10 F 4, Maize± 10 G 2, Buff 10 K 6, Chinese Yellow 11 D 4, Maple± 11 K 8, Gold Leaf 12 F 4 12 K 1 12 K 5 12 L 7, Burnished Gold 12 L 9, Golden Yellow±	13 J 11, Sorrel 13 L 9, Raw Siena±	15 A 9, Dark Beaver 16 L 12, Bronze±
Yellow-to-Green: Plates 17-24	20 D 5 20 F 6, Pea Green±		23 E 5 23 H 4 23 J 1 23 J 4, Lincoln Green 23 L 4 24 A 7
Green-to-Blue-Green: Plates 25-32			31 C 7, Poplar± 32 J 6, Spruce±
Blue-Green-to-Blue: Plates 33-40			38 H 3 39 H 3 39 H 4 39 H 9 39 J 6
Blue-to-Red: Plates 41-48		45 B 1, Zinc 45 I 7, Amethyst±	46 A 1, Cement Gray 46 J 6, Old Mauve± 48 J 6 48 L 12, Egg Plant±
Purple-to-Red: Plates 49-56			

† Notation follows that given in Maerz and Paul's Dictionary of Color.

‡ Black, darker than any of the printed samples, appears in practically all of the needleknitted specimens. It is rarely a true Black, but most nearly matches the darkest Brown, Green, Blue, Purple.

* The ± sign indicates an approximate match.

Due to the probability that some hues were overlooked in matching yarns to the printed samples in the Dictionary of Color, a count is little more than indicative of the minimum number in a needleknitted specimen. Compilation of the number of hues counted in the more familiar types of needleknitting shows, however, the forms which tended to elaboration through the use of many colors:

Number of colors, at least	Type of needleknitted specimen
3-4.....	Human head ornaments
7-8.....	Veneered tapes with tab or fringed edge
8-14.....	Bird and flower fringes

The Needleknitting Technique.—The weavers of the Early period in Nazca seem to have revelled in passementeries of the 3-dimensional type and veneered bands with tabs or fringes

or both.³⁰ This must mean that the simpler forms in the needleknitting technique, whatever they may have been, were outgrown or had been elaborated. Whatever forms preceded them, the 3-dimensional bird and flower fringes represent needleknitting embroidery at its peak. Nothing as fine as the Larco-Herrera cloth from Paracas has been reported from Nazca Valley, but structurally the specimens from that locality are the same as those from the Necropolis at Paracas. The 3-dimensional types imply that the embroiderer did not depend on the woven material of the garment upon which to work a trimming. She visualized the finished embroidery, and provided the necessary foundations for the specific forms which she meant to make.

The needleknitting stitch itself is a variant of the cross-stitch (Plate LXIIIa, b). It may be employed to make a narrow line or a wide band, but it must be constructed over foundation material or a core. Specimens of needleknitting in the Early Nazca collection illustrate types of specially constructed foundations such as narrow tapes, shapes made by buttonhole stitchery, and twists of yarn for cores. The examples already described required one, two, or three of these foundation types.

Specimen 171309, a veneered tape with tabs, has a woven cotton foundation 8 warps wide. The tabs are constructed of buttonhole stitch (Plate LXId). The tape and tab fabric are covered with needleknitting. The squarish human heads also have a cotton foundation made of buttonhole stitches worked row upon row. This foundation is invisible, hidden by fine needleknitting stitches, about 24 per inch.

The construction of the bird-flower fringes must have required the greatest technical skill. Veil or mantle 171112 is a characteristic example. The main points in its analysis supplement the description of its motives and colors given above. The foundation for the "branch" element is a woven cotton tape approximately 1/2" wide. This is completely hidden by the needleknitting stitches which represent the bodies and feet of the birds. The stitches are worked crosswise of the band.

The birds' heads which rise from the "branch" are shaped, and therefore a woven foundation was impractical. But a foundation built up of simple embroidery stitches (the buttonhole stitch, or coil without foundation) was feasible. The fabric shown in Plate LXIIIg was reconstructed stitch by stitch to follow the microscopic analysis of one of the heads in specimen 171112. Shaping is shown to have been accomplished by adding stitches at certain points.

The tail feathers were veneered cores formed by tightly twisting three short lengths of cotton yarn, folded end-to-end to make a loop. The three were veneered as a group with several rows of needleknitting stitches. They were then separated so that each represented a single tail feather (Plate LXIII f). It is probable that this same device was resorted to when foundations were required for similar shapes.

Whether the object of the embroidery herein called needleknitting was to veneer a flat tape, a tab, a flower form, a bird, or any other foundation shape, the actual appearance of the single stitch units varies but slightly. Reconstructing an ancient technique with modern materials duplicates the effect, but does not necessarily prove that the method followed was that of the original weaver or embroiderer. From that standpoint we cannot be sure until we find a piece of unfinished needleknitting accompanied by the tool or tools used that it was made with an embroidery needle. However, the plain bands of any number of stitch loops, and any of the veneers, in fact any of the details with which I am familiar, may be duplicated according to the following directions:

Step 1. Begin with one, or any number of plain cross-stitches made in a horizontal line from left to right. At this point the needle is passed by means of a long stitch on the

³⁰ For an analysis of the technique see Peruvian "Needleknitting," *American Anthropologist*, n.s., vol. 36, pp. 405-430, 1934.

under side of the cloth so as to bring it out into position at the extreme left and just below the row of cross-stitches (Plate LXIIIa, b).

Step 2. Slip the needle—but do not pass it through the cloth—from right to left under each of the crosses in turn. This step completes each needleknitting stitch in the row, and brings the needle out again at the extreme right.

Step 3. Pass the needle again through the cloth from the right to the left to bring it into position at the extreme left and just below the preceding rows of needleknitting stitches.

Repeat steps 2 and 3. Patterns are made by dropping the yarn of one color to continue with that of another (Plate LXIIIc).

PATTERN WEAVE MANTLES

Pattern weave differs from brocade. In the latter there are basic warps and wefts which form the fabric independent of the supplementary warps or wefts which form the design motives. These last may be removed without demolition of the cloth itself. But in a true pattern weave, called figure and Jacquard weave by modern weavers, the basic warps and wefts not only make the foundation material, but also float on the surface wherever necessary in developing the design motives. If one of these pattern yarns is pulled out of the cloth some of the basic web is lost. Of the two types, pattern weaving indicates a higher stage of technical development than does brocading.

The Early Nazca collection contains one complete and two fragmentary mantles in pattern weave technique. Specimen 171119 is 40" square, the width made by lacing two 20" breadths together. The texture is canvas type, warp face. It has the appearance of being an everyday garment. The weave is plain, except for a narrow double-face pattern-weave border across the ends. An interesting detail shown by this Early piece may also be found in the textiles of the Middle and Late periods in Peru: the crossing and grouping of the basic warps at the point of change from plain weave to the tapestry (Plate LXVIIIc). The method followed is the same for all pieces: pairs are formed by drawing together warps 1 and 3 and warps 2 and 4; warps 5 and 7 and warps 6 and 8, etc. The crossing prevents the weft yarns of the new technique from sliding or crowding the yarns of the finished weaving, and the grouping into 2's doubles the warp strength. In specimen 171119 the plain weave changes, after the warp crossing against slip and grouping, to tapestry weave for a few picks of weft. Tapestry weave is plain weave with the wefts so closely battened together that the warps are covered. It is an effective way to give a boundary line of color to a design band and firmness to an edge. The pattern weave which classifies this specimen is simple, and not too accurately accomplished. The design motive is a diamond with center dot set in a long rectangle below the Red tapestry stripe (Plates XLIIIb, XLVc). The colors are dingy, but certain pairs may be distinguished: Orange and Brown, Light Blue and Black (almost a Jet), Pink and Brown, Blue-Green and Brown. Where the colors of two rectangles meet, the individual wefts interlock on the reverse side (Plate LXVIIIe).

The remaining two of the trio of pattern weave specimens are alike in technique. They are fragmentary, but their widths, 23" (full width of one breadth, 171279a) and 26½" (partial width of 171218b), indicate that they were mantles. Flat-view diagrams of the designs are shown in Plates XLIVa and XLVII. Both are plain weave fabrics within which the patterns are developed on surface and reverse sides by floats of the warps and wefts.

Specimen 171279a is the simpler of the two. The set-up is in two colors, White and Brown (natural?). One unit of the repeat is given:

Colors:	W	BR	W	BR	W	BR	W	BR	W	BR	W
No. warps:	36	4	2	4	2	6	2	4	2	4	36

The wefts cross in exactly the same order, 36 White wefts followed by 4 Brown wefts, 2 White, etc. This weft crossing would result in a simple plain weave plaid if the warps and wefts were not allowed to "float" or "flush" over certain groups. The diagram cited shows the positions and designs developed by these floats. This specimen shows, as many do, the freedom a hand weaver enjoys. A mechanical loom is set in such a manner as to force repetitions of units at certain spaced intervals. In mantle 171279a there are a half dozen different arrangements of spacings and positions of the floats to vary the design units.

Mantle fragment 171218b is an elaboration of both the plaid and pattern by contrast with the preceding example. The technique is similar. The set-up is in Brown yarns (8 L 11), Blue (39 E 4), Pink (11 B 6), Jasper Green (32 H 9), and White. The method by which warp and weft yarns are manipulated so that floats of each will develop the design motives is shown in Plate XLVII.

GAUZE WEAVE MANTLES

Of the three fragments in this technique only one is large enough to justify placing it in the mantle class. Specimen 171110 is a torn strip 32" long by 9" wide. Its length is the guiding factor to its classification. The background is plain weave, the motives true gauze weave. This latter is made by drawing one active warp of a pair, or two active warps of a group of four over the passive one or two warps, and securing the cross so formed by passing the weft through it. In this specimen warps 1 and 3 are crossed over warps 2 and 4. Peruvian weavers seemed content only in rare instances to stop with simple crossings of a single or a pair of warps. They usually separated a pair to cross each single with other singles for several passages of the weft. Plate XLIa shows the shifts in position of any one yarn before being returned to its original place in the set-up. The effect is more like lace than is that given by our own standard gauze weaves.

The motives in the Peruvian gauze weaves are often elaborate. The style in the Early Paracas period, the Caverns, was for most complicated patterning. This Cahuachi example is white cotton with simple allover pattern in the ubiquitous stepped fret, each motive 5" on the warp by 3" weftwise (Plate XLIc).

Fragment 171141 is a plain weave cotton fabric with stepped fret motives in bands, allover effect. The yarn is dyed a darker Blue than any sample shown in Maerz and Paul.

Several small Blue wool fragments, Majoro 170476f¹, were probably part of a mantle or veil. The weave is plain with cross stripes of gauze forming the pattern. The gauze is made in the usual manner: crossing warps 1 and 3 over 2 and 4 in the same group. The count of the plain weave portion is 34 warps by 36 wefts per inch, a contrast in quality with the two cotton specimens, 30 x 24 and 26 x 26 per inch.

The fragments do not contain the complete gauze weave motive. Rows of crossed warps about 2" long are grouped in fours to form a rectangular unit $\frac{3}{4}$ " wide. The drawing (Plate XLIb) shows the arrangement of these units in a stepped diagonal of gauze weaving. In addition to the decorative weave there are appliquéd S-form motives: a 3-strand braid in Gold (12 K 9) wools, and a 4-strand flat braid in Rose (5 K 9) and Dark Green (32 C 8) yarns. Appliquéd of yarn-made motives is rare in Peruvian textiles.

One of the gauze weave fragments of this same mantle has a border tape $1\frac{1}{4}$ " wide still held to it with long whipping stitches. The tape was originally between two webs, since

remnants of stitches on its opposite edge show that material has been torn away. The weave is plain, with a pattern in warp floats making lozenge motives through the center of the border. The same three colors appear in the border as in the rest of the specimen, the Blue and Gold in $\frac{1}{4}$ " stripes on either side of the Rose center portion.

MISCELLANEOUS MANTLE TYPES

INTERLOCKING WARPS AND WEFTS

A unique method of patterning is illustrated by Cahuachi specimen 171221 (Plate XXXIXd). The weave is plain throughout, and color changes are effected by interlocking weft yarns at their points of meeting. This is tapestry weaving, but in tapestry the wefts are so closely beaten together that they completely cover the warps, forming a dense fabric. In the Cahuachi specimen the warps and wefts show equally, and the pattern as well as the basic web is as sheer as the quality of the yarn permits.

Plate XXXIXb, made after a reconstruction, shows the method of weft interlocking, and the manner in which the triangular projections out from the motive are woven. Those on the long sides are formed by extending the colored weft of the main decorative bands to the desired distance; but each of the triangles edging the outer and inner ends of the figure has its own individual length of colored weft which interlocks at every turn with corresponding turns of the white weft of the background. The warp-weft count per inch, 28 x 32, indicates quality of the material. The wool yarns are single-ply wools.

None of the mantle corners is complete, but two are in condition to show the color changes. The double-headed monster motives are represented with striped bodies, solid color heads, eyes and smaller details in one or another of the three main colors.

Motive No. 1, stripes:	Blue (39 J 8)	Rose (4 H 10)	Green (15 J 1)	Rose (4 H 10)	Blue (39 J 8)
head:	Blue				
Motive No. 2, stripes:	Gold (12 J 9)	Green (15 J 1)	Brown (15 A 10)	Green (15 J 1)	Gold (12 J 9)
head:	Gold				

The yarns are not consistently one color throughout a motive. For instance, both Brickdust Red (5 L 11) and Rose (4 H 10) are found. The third corner is too fragmentary to show a color sequence, and the fourth corner is missing entirely.

Multicolored Patchwork Mantles.—The mass of wool fragments constituting Cahuachi specimen 170211e gives no indication of its original size, but at least it could not have been a kerchief, nor does its fragile texture suggest a tunic (Plate XXXIXc). It might have been a veil or turban piece, or a mantle. This type of fabric seems to have been well developed even in the Early period. It got its name because of its appearance, although the term "patchwork" usually implies seaming together bits of already-woven fabric.³¹ In the case of the Peruvian examples, the evidence all points to their having been made wholly on the loom. Successful reconstruction of the technique has been accomplished through the use of supplementary transverse yarns, scaffolding, or skeleton wefts. Between these it was possible to set up warps of different colors, and to so group them that they formed geometric designs. When warps of two colors met on a transverse yarn, they interlocked. This allowed the transverse yarn to be withdrawn upon completion of the pattern; neglected remnants have been the clues in the analysis. Once the warps were placed, wefts of the same color—sometimes the ends of the same lengths of yarn that formed the warp setups—crossed them,

³¹ Textile Periods, pp. 39, 40, 41, 49–51; figs. 8–10; plates 6a, 19. A.A., n.s., vol. 35, pp. 87–94, 1933.

and interlocked with wefts from the adjacent motives. Each detail thus woven is monochrome, in strong contrast to the other details surrounding it. Some of them, border lines especially, are so small as to have required needles for bobbins in the weaving.

This form of woven material permits a range of colors only limited by the number of geometric design units in its pattern. As a matter of fact, were we in possession of a complete piece we might discover one of the elaborately conceived color sequences in which Peruvians of all periods took delight. The design motive in both specimens 170211e and 171111 is lengthwise stripes of interlocked step frets, each outlined with a narrow band of White or Buff. The particular fragment drawn for Plate XXXIXc has ten colors. Matching yarn swatches from the mass of fragments to the color samples in Maerz and Paul's Dictionary revealed more:

Red-to-Orange group:

Light: Rose, 1 J 9; Red-Orange, 4 G 10, 4 K 9

Medium: Barberry, 5 L 7

Orange-to-Yellow group:

Light: Honey, 12 J 6; Gold \pm , 12 L 9; Hazel \pm , 13 L 9

Yellow-to-Green group:

Medium: Grass \pm , 21 J 4

Dark: 21 E 5

Green-to-Blue-Green group:

Dark: 32 J 6

Blue-Green-to-Blue group:

Dark: 40 J 8

Blue-to-Red group:

Dark: Slate, 47 C 6

Purple-to-Red group:

Dark: 56 A 5

Twined and Painted Fragments.—A large irregularly shaped fragment, Cacatilla *8537, is included among the mantle types, although it may have been a veil or turban. The piece was not constructed on a loom or by interlacing warp and weft elements, but by continuously twining pairs of yarns. It is by the separation of these pairs to enclose other pairs, or by the progression of the pairs at angles to right and left that patterns are formed (Plate LIV). The whole fragment is marked off horizontally by three herringbone bands alternating with $1\frac{1}{2}$ " squares in the same twining technique. The 2-ply wool yarn seems to have been a Red which in some areas matches Maerz and Paul's Reddish-Purple 47 J 1, in others Havana Rose 6 K 9. Color variations within the same piece are typical of a good many of the wool yarns. Reds often fade to Browns in which Orange, Yellow, or Red may be predominant.

Trancas *9056, a cotton fragment about 22" square, is also included within this mantle category for want of any better means of identification than its texture and general appearance. Its warp-weft count, 34 x 26, is similar to some among the plain weave, undecorated types. The painted pattern represents birds in rows so closely set together that the effect is an allover. Two typical features of Peruvian design arrangement may be seen in the Trancas fragment. Within a horizontal row of motives, birds with three-feather tails alternate with birds with fan-shaped tails. They all fly in the same direction. The birds in the next row are more or less identical with those above them, but they fly in the opposite direction (see Text Fig., p. 135). In a more perfect piece, the diagonal lines of similar motives would be insistent.

Schematically, with the two types of birds represented by 3-F (3-feather tails) and F-S (fan-shaped tails), the result shows the following:

F-S	3-F	F-S	3-F	facing right
3-F	F-S	3-F	missing	facing left
F-S	3-F	F-S	3-F	facing right
3-F	F-S	3-F	missing	facing left
missing	3-F	F-S	3-F	facing right

The alternation of motive types within a course or row, and the alternating rows of right-face and left-face motives may be recognized as a convention among the prehistoric weavers and embroiderers. This same arrangement is found in both Nazca and Paracas textiles,

from periods at the very beginning of the Peruvian time scale as we know it, and apparently it was as aesthetically pleasing to the Inca craftsmen at the end of the prehistoric time scale.³²

The White basic web seems to have been washed over with a neutral Green or Gray paint after the pattern was put on. The whole effect of the piece is dull. Colors identified are Golden Brown, Black, Red, and Green. Most of the birds bear seeds, plants, or leaves in their beaks. Certain resemblances to the forms painted on the Early Nazca pottery may be recognized.

³² Textile Periods, plates 29 and 30. The motive is llamas in these Late textiles, but the Early period birds are arranged in like manner.

EARLY NAZCA TUNICS

The Early Nazca collection contains four tunics—two children's, two adults'—sufficiently complete to allow determination of several characteristic technical and decorative details. Other specimens have been allocated to this group on the basis of their resemblances to the better-preserved pieces. These more or less unidentifiable tunic fragments will be considered separately.

The available material is too scanty to justify many inferences. What we should like to know is whether the wool or the cotton tunics were considered the finer, and whether any type of decoration was locally favored. In the following tabulation the full length of the tunic as worn is just half the length of the woven web.

Specimen number	Full length of garment	Full width of garment	Proportions W : L	Warps per inch		Wefts per inch	
				C2	W2	C2	W2
Children's:							
171071d	10"	15"	1.5	40	..	36	..
171266b	26"	22"	0.85	32	..	30	..
Adults':							
171217a	33"	46"	1.4	..	44	..	20
171308	39"	45"	1.2	..	42	..	18

From the standpoint of proportions, the tunics and mantles cannot be compared, since one is woven for wear as a rectangle, and the other, although woven a rectangle, is folded on the crosswise center and seamed up the sides. The textures of the two garment types differ, also. The median warp-weft count for the mantles is 32 x 26, the count for a wool specimen; both cotton tunics are finer than this. The wool mantles are heavy, but less because of the closeness of their basic weaves than because of the weight of their fringed edges; the wool tunics are definitely warp-face, one or two of the fragments in the unidentifiable group being similar to tapestry in quality.

Since the tunic is not only a woven web but also a seamed and decorated garment involving a number of different types of workmanship, I shall first present a summary analysis of each of the four specimens, and after that a detailed analysis of each of its technical features.

(1) Child's tunic. Cantayo C-ax 171071d (Plate XXXIVd). Size of complete web, 20" x 15"; side selvages whipped together to form garment; plain weave warp face; 11" Kelim slit left for neck opening. Needleknitted binding around neck opening 7 loops wide, 5 of which show on surface side of the garment; 5 loops wide on edges of armseyes. Fringes, needlemade, 1" deep around bottom; also at armseyes. Yarn counts, 40 warps by 36 wefts per inch of 2-ply brown cotton, hard twist; yarn in bindings, 2-ply wool dyed various colors.

The Kelim slit is a familiar Peruvian type of neck opening (Plate LXVIIIg). It is constructed by turning wefts proceeding from opposite side edges around adjacent warps at the center of the piece. Since these meeting wefts do not interlock, an opening of the desired size is left in the lengthwise center of the web. The needleknitted edge finish in one or another of its variations is also a familiar technique and occurs in all periods on cloths from central and southern sites.³³ The form found on this tunic specimen, a binding, is often patterned, and in this case has small plant-like motives at close intervals (Plate LXIe). These are in a maintained sequence of Light Green, Coral, Dark Green, Yellow, Navy Blue,

³³ American Anthropologist, vol. 36, pp. 410-411.

Orange, and Black on a Rose-Red field. The method of making a patterned band is shown in Plate LXIIIc. The fringes were apparently made after the weaving was completed by drawing two extra strands of yarn down and up through each weft turn at the armseye edges and through each warp turn on the bottom or loomstring ends (Plate LXVIc). Loops of desired length were left, groups which, due to the tightly spun yarns, twisted about each other.

(2) Child's tunic. Cahuachi 171266b (Plate XXXIVc). Size of complete web, 52" (including fringe) x 22"; side selvages, whipped together to form garment; plain weave; Kelim slit left for neck opening in both the main web and in the separately woven band which forms the foundation for the embroidery; fringes at armseyes and around bottom of tunic. Embroidery across shoulders of garment in addition to that on the separately woven bands appliquéd at neck and at armseye edges. Remnants of feathers in three places between shoulder motives, each feather tied on by its quill. Yarn counts, 32 warps by 30 wefts per inch of 2-ply white cotton; applied fringe yarn, 3-ply white cotton of two different sizes; embroidery yarn, 2-ply wool, various colors.

The Kelim slit opening is woven in the customary manner but is later reinforced by two rows of blanket stitching (Plate LXa).

The fringes are of two types: that around the bottom of the tunic is made by leaving the desired length of warps unwoven below three heavy loomstring wefts (Plate LXVIa). The 6" depth is unusually long for this type of construction. The armseye fringes might be described as woven and subsequently applied to the edges. Two warps close together and a third $5\frac{1}{2}$ " distant provided the foundation for weaving. Upon completion of the desired amount of fringe the third warp was withdrawn, leaving long weft loops to twist together in groups (similar in construction to that shown in Plate LXVIId).

The embroidery which is done directly on the tunic is in the form of solidly worked rectangles approximately $\frac{3}{4}$ " by $\frac{1}{2}$ ", alternately Red and dark Brown, seven rows of six across one shoulder, and nine rows of six across the other. The embroidered appliquéd bands, 1" wide, show flower or fruit forms and monster heads in Rose, Black, two Yellow-Greens, Gold, Ecu, and Brown wool yarns on solid Red fields (Plate LVI).

The embroidery is the simple outline or stem stitchery in rows set close together (Plate LXg). For the small rectangles, the usual length of stitch is equivalent to the diameters of four warps. Where the design requires curved lines, the stitches are somewhat shorter. The work progresses from left to right with the needle passing over four warps, back under two on the reverse side, over four from this point, and so on.

(3) Man's(?) tunic. Cahuachi 171308 (Plate XXXIVe). Size of complete web 78" x 45" (two breadths seam-joined); side selvages whipped together to form garment; plain weave, warp face; interlocking warps and wefts, Kelim and eccentric tapestry variations. Fringe across ends and armseye portion of side edges. Yarn counts, 36, 40, 52 warps by 18, 20 wefts per inch (the differences depend upon the portion of the tunic surface selected for count) of 2-ply natural(?) and dyed(?) wool. The yarn used in the tapestry woven borders is the coarsest.

The two webs forming the garment were separately woven. Saddler's seams join the two at center front and back; plain whipping seams close sides (Plate LXVIIc, j). Plate XXXIVe shows the $4\frac{1}{2}$ "- $5\frac{1}{2}$ " blocks of contrasting color which form the central portion of the tunic front and back. Five skeleton wefts were necessary in order to effect the color changes. The warps for each block were crossed only by wefts of the same color. These interlocked at the side edges. The type of weaving which involves skeleton warps, wefts, or

both, and interlocking basic warp and weft elements has been called "patchwork" although no stitchery enters in as seems implied by the name.

The body of tunic 171308 is Bronze Brown (15 H 11); the blocks are Yellow Beige (13 H 7) and Chocolate Brown (8 J 10). Tapestry borders in several other colors are woven about an inch up from the end loomstrings. Upon changing from the plain weave of the garment to the tapestry variation, the warps are grouped in fours, and held in these groups by two rows of twined yarns (Plate LXVIIIa). These outline the two edges of the borders through which a center line of zigzags forms reciprocal triangles. The Orange yarns making the zigzag are put in by a tapestry technique called eccentric wefting.³⁴ Finally the twining yarns and the eccentric wefts are twisted or are plaited together on the reverse of the garment at the side seams (Plate LXVIIIa).

The colors of the triangles formed by the zigzags are exchanged at intervals of six inches, approximately, according to the following plan:

R	R	R	R	R	R	G	G	G	G	G	G	R	R	R	R	R	R	B	B	B	B	B	B
G	G	G	G	G	G	R	R	R	R	R	R	B	B	B	B	B	B	R	R	R	R	R	R

A fringe of unwoven warp lengths finishes the lower edges of tunic 171308 (Plate LXVIa), and separately woven fringed bands are sewn to the armscye edges. These bands, 16" x 1¼", contain the same zigzag pattern as that of the lower edge borders except that Red yarn always makes the outer triangle. In weaving, this Red yarn is carried beyond the outer edge of the band to a skeleton warp or similar device 7" distant (Plate LXVIa). The subsequent removal of this warp results in a deep fringe. Both the bottom and armscye fringe yarns cling to each other and twist so tightly that instead of soft loops there seem to be fairly good sized cords pendent from the edges.

(4) Man's(?) tunic. Cahuachi 171217a. Size of complete web 66" x 46" (two breadths seam-joined); side selvages whipped together to form garment; plain weave, warp face. Embroidery and fringe across ends; tapestry woven band and fringe for armscye portion of side edges. Yarn counts: main web 44 warps by 20 wefts per inch of 2-ply wool, dyed, crêpe twist; tapestry bands, 14 warps of 3-ply white cotton, each ply double, by 22 wefts of 2-ply dyed wool per inch (Plate XXXII, Frontispiece).

This tunic is seemingly a finer garment than Cahuachi tunic 171308 described above. The basic web is a rich Red and the tapestry band (10½" x 3") seamed to the armscye has zigzags lengthwise of the piece woven in Kelim and eccentric tapestry techniques (Plate XXXVIIIa). The sequence of colors is irregular: Yellow, Red, Blue, Yellow, Purple, Yellow-Green, Red, Blue, Yellow. The separately woven fringes of Blue-Green wool are attached to the outer edges of the bands. These were made over five closely set warps and a sixth placed at a distance of 6". This last was withdrawn upon completion of the weaving. The fringes around the lower edge of the tunic are unwoven lengths of warp loops approximately 1½" deep. A bunch of these loops is separated into two heavy "warps," those coming over the original loomstring forming one, those coming under the loomstring forming the second. A loosely twisted Blue-Green yarn woven over the two "warps" in figure-8 technique produces the effect of a soft flat knob (Plate XXXVIIIc). Just above the fringe pairs of yarns in two colors (Green-Blue with Blue; Golden Brown with Yellow-Green) are twined to form two narrow borders. The work began at the right, leaving a loose end of the yarn extending beyond the edge, progressed to the extreme left, then back to the right again, leaving a second length of yarn. Repeating with the second yarn of the color pair furnished four ends at the side edge. These were plaited in a flat braid in which was maintained the same arrangement of colors as in the stitchery.

³⁴ M. D. C. Crawford, *Amer. Mus. Nat. Hist., Anthr. Papers*, vol. 12, p. 91, fig. 19, 1915.

Decoration for Kelim Slit Neck Opening.—Cantayo 171071b, a complete specimen, presumably was intended as a trimming for the neck opening of a tunic (Plate LXIIc, d). The piece is noteworthy because the method of its construction is clearly visible, and the quality of workmanship unusually fine. A plain weave cotton foundation band ($14\frac{1}{2}" \times 1\frac{5}{8}"$; 44 warps \times 40 wefts per inch) was woven with a long Kelim slit (Plate LXIIc). A second type of foundation, a small rectangle $\frac{5}{8}" \times 1\frac{1}{2}"$, was built up row upon row with buttonhole stitches (Plate LXVa). There are sixty-eight of these tiny tabs edging the band. The surface side veneer on band and tabs is needleknitted: a Red ground with bird motives in a variety of colors on the band, a plant-like motive on each tab. Perhaps a regular sequence of colors was planned since three of the motives on one side of the slit are duplicated by three motives on the opposite side. Each bird motive is subdivided into the following color areas: head, eyes, nose, beak, the object held in it, body, wings, wing tips, tail, tail tip. Some of these are given a decorative spot, and every detail is bounded with a Black line one loop wide. The ten or a dozen colors are similar to the Red (5 L 11), Blue (39 J 6), Yellow (10 G 2), Orange (11 K 8, 13 L 9), Yellow-Green (23 J 4, 32 J 6) of the needleknitted bird-flower fringes described in the mantle section. To develop a design involving a number of colors was not, I believe, especially difficult, but it did mean carrying along all of the yarns required by the motive so that each might be available when needed in a certain position (Plate LXIIIc). The embroidery yarns are usually hard twisted, a feature that would add to the difficulty of manipulating them.

Tunic Materials, Identified by Stylistic Features.—Three other Cahuachi fragments are similar in texture and details to tunic 171217a. The most complete is specimen 170211f, which measures 30" \times 15". The fabric is a plain weave, warp-face wool, yarn count 46 warps by 24 wefts per inch, woven with 2-ply yarns. Whipping stitches remain to show the seam-joined breadths down the center of the garment and at the side selvages. Across one edge, corresponding to the bottom of the tunic, there is a short fringe of unwoven warp lengths. Twining weft yarns in Dark Brown and Cream wool yarns head the fringe. This technique is also found on tunic 171217a.

Specimens 170211g and 171118c are very small fragments of dark wool fabrics. The first has a warp-weft count of 64 by 24 yarns per inch, and the second 76 by 18 per inch. All the yarns are 2-ply wools. The yarn counts of these fragments together with the two better-preserved garments indicate an appreciable range in quality: 42, 44, 46, 64, 76 warps per inch; 18, 18, 20, 24, 24 wefts per inch. Warp-face materials as closely woven as these have the appearance of fine canvas-like fabrics.

One of the main criteria for including specimens 170211f, g and 171118c in the tunic group with specimen 171217a is the similarity of their dyed yarns. As with other specimens, there are too many variations in the color of large areas to be certain of the original hue. Tunic 171217a is Red-Orange, matching Maerz and Paul's 5 J 11 and 5 L 11 (Brickdust); fragment 170211f is slightly grayer and darker, 6 L 11, almost an Indian Red; fragment 171118c is Red, but a darker, Purplish or Haematite Red, 7 J 3; and specimen 170211g is darkest of all, a Purplish Brown, 8 H 6.

A fragment of woven fringe, Cahuachi 171118b, is constructed like those found around the tunic armseyes. The foundation is typical: several warps, in this specimen two, close-set, and a skeleton warp at the desired depth of the fringe away from the others. The colors of the wefts are in a regular sequence, to judge from the 3" fragment: Black, Red, Yellow, Green, or Blue as 1-2-1-3, 1-2-1-4, repeat.

EARLY NAZCA KERCHIEFS AND VEILS

For want of a better term relatively small webs decorated in various ways together with two sets of trimming bands similar to those found on intact specimens are classified as kerchiefs. They may have been worn as head coverings, or veils, except that the texture of the material does not warrant the latter word in most instances. All but one are cotton pieces. The decorative yarns are invariably wool.

The sizes, yarn counts, and methods of decoration by which one sub-group is distinguished from another appear in the following tabulation:

Kerchief type	Specimen number	Complete length	Complete width	Proportion W : L	Warps per inch	Wefts per inch
Undecorated.....	171071a ¹	14	15	1.07	30	38
Weft stripes.....	171305c	frag.	frag.	.....	20	26
Applied bands.....	170462b	frag.	frag.	.....	36	24
Applied bands.....	171033	16	14½	0.906	42	30
Applied bands.....	171059	6½	9	1.38	34	22
Applied bands.....	171226	18½	20	1.08	36	40
Embroidered.....	*9120	11½	13½	1.17	34	26
Embroidered.....	171266a	frag.	frag.	.....	38	32

The main difficulty with the classification as presented is that it does not provide any clue to the differences in texture. These set apart two fragmentary pieces in particular: Cahuachi 171266a and 171305c. Each is further distinguished from the other specimens by having a simple knot tied in one of its corners. Both are in extremely fragile condition, but specimen 171266a was originally 31" wide, to judge by a 15½" breadth and a portion of a second still attached to it by fine seaming stitches. The other specimen is charred beyond possibility of measuring.

Both veils are patterned. Specimen 171266a has small rectangular motives (approximately ⅝" by ¾") set in one inch from the side edge, and about a half inch apart (Plate LXc). The lines filling the rectangles are made by a double running stitch similar in appearance to twining in basketry or weaving. After one series of running stitches outlined the form of the motive the spaces between the stitches were filled by a return series. The twining effect is gained by inserting the needle first above and then below the original stitch as shown in the drawing. The fragment is not long enough for a repeated sequence, if there ever was one. The single-ply dyed wools used are still bright and fresh looking. Matched to the printed samples in Maerz and Paul's Dictionary, they were found to be the following, in the order given: Tan (approximately 12 L 8), Grass Green (approximately 21 J 4), Purple-Red (43 H 5), Shell Pink (1 C 10), Green-Blue (39 H 3), Bronze (14 L 9), Dark Green (32 J 6), Barberry Red (5 L 7), and Yellow-Orange (12 A 8).

Cahuachi specimen 171305c is patterned by a very simple method of striping, but one I do not recall having seen before among ancient Peruvian textiles. Weavers of pre-Incaic tapestries usually began their patterned areas and zones with a series of lines and narrow monochrome bands running weft-wise. Other striped fabrics are usually warp face materials, with stripes running warp-wise. This Cahuachi fragment has a yarn count which shows it to be weft face, 20 warps by 26 wefts per inch, but the general effect is that of a gauzy material, similar to a square count fabric. The unusual feature is the introduction of a series of colored single-ply wool yarns in crosswise stripes of Bronze (approximately 14 L 10 and 16 L 12), Rose (4 I 10), Olive Drab (approximately 15 L 5), Etruscan Red (4 H 11), and Orange-Yellow (11 H 10). These are not battened down tightly, but are slightly spaced to

the same degree as are the cotton wefts, contrasting strongly with the usual weft-wise stripes of tapestry (Plate XXXVIIj).

Majoro 170462b, also veil-like in texture, apparently was used on the head, judging from the quantity of human hair among the fragments (Plate XXXVIIb). It is a plain weave material, made of single-ply crêped cotton yarns. A $\frac{3}{4}$ " band is sewn to the edges of some of the bits. That, too, is plain weave with a set-up for warp stripes: a dull Bluish-Purple (47 E 1) in the center, 3 Brown (15 E 8) and 2 Red (4 J 10) stripes on either side.

One other specimen, Cantayo 171033, deserves special treatment (Plate XXXVIIg). It is an all-wool striped piece, similar in general effect and decorative features to the Cahuachi striped wool mantles already described. The amount of actual handwork represented by this kerchief is out of all proportion to the effectiveness of the result.

First, the weave: a set-up for stripes in three colors, 4 Black yarns, 4 Yellow yarns, 4 Red, 4 Yellow, 4 Black, etc., with a variation in stripe widths due to crowding together the Yellow warps. This makes the Yellow stripe a finer weave than the Black or Red ones.

Two complicated edging lengths, each of which is seamed down a long side and part way across the two ends, make this kerchief a miniature mantle. As was noted above, the striped wool mantles of Cahuachi and the Paracas Necropolis embroidered mantles illustrate the same conventional arrangement of trimming: side trimmings—fringes or tabs—and embroidered borders which extend around each corner for a distance, leaving a center space at either end (Plate XXXIVb).

The $\frac{1}{2}$ " edge trimming of kerchief 171033 consists of three parts, as shown in Plate LXIVc.

(1) A brown cotton tape 6 warps wide ($\frac{1}{8}$ "), the foundation for stem stitch embroidery which completely covers it. The ground work is Red, and the minute motives (leaves? flowers?) are in six other colors: Rose, Yellow-Orange, Green, Blue-Green, two Blue-Purples. The embroidery is on a smaller scale than is usual through being confined to the space represented by two warps, since the outer two on either side of the tape are used for fringe and "picots."

(2) A $\frac{1}{4}$ " fringe made of a length of yarn woven figure-8 fashion between one edge warp of the foundation tape and two extra warps, the outer one a skeleton. The latter was withdrawn upon completion of the weaving.

(3) Small "picots" set $\frac{1}{8}$ " or less distance apart on the side of the tape opposite the fringe. In reconstructing these, as the drawing shows, the whipping stitches progressing from the left were elongated to extend between the tape edge and a skeleton yarn. Three of these stitches equalled six "warps" upon which the same length of thread that made them wove the tiny rectangular tabs. The drawing can give no conception of the effect of the fringed tape. It is colorful, but, as has been said, is too small to be truly effective. It compares, I think, to the fine needlework of our own times which spells achievement rather than an aesthetic result.

The other specimens in the group are similar in texture to some of the mantles and aprons. They are plainly a less elegant type of garment than those already analyzed.

Cantayo specimen 171071a¹ has no feature technical or otherwise except its size to give it character.

Embroidered kerchief *9120 from Nazca Valley and Cahuachi flower mantle 171222 are two of the few allover patterned pieces from this period. The kerchief motives, crosses and rectangles in rows, appear to have been worked with casual regard for sizes, placing, or color sequences (Plate LVa). Several of the crosses are in two colors as if the embroiderer had made use of short lengths of yarn.

The stitch is a long double running stitch in which the embroidery yarn is left slack enough to cover entirely the basic weft yarns (Plate LX*i*). The work is mediocre by comparison with the same type done on the four-warriors mantle 171216. On opposite diagonal corners there are Red and Yellow tassels made by drawing 18" lengths of yarn through the tips and there twisting the ends together. The usual Peruvian colors are present, together with Purple-Red (48 H 2) and dark Purple-Blue (48 E 10), of special interest in the Early Nazca period.

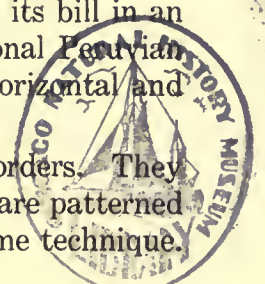
Kerchief 171059 is a cotton rectangle measuring less warp-wise than weft-wise (Plate XLIII*c*). This is rare. Separately woven pattern bands with warp-loop fringes are sewn to the side edges. Each band is a warp set-up of Red, Black, and Bronze-Green yarns arranged in the following order: stripes of 2 Black yarns and 2 Green yarns on either side of a center portion of 12 yarns: 6 Blacks alternating with 6 Reds. The block pattern in the center portion is single face. Unlike most pattern weaves, this type is a simple variation of the plain weave without floats. All the warps making the side stripes are crossed each time in regular fashion, but upon reaching the 12 Reds and Blacks in the center, the Reds are left down and the Blacks are brought up (Plate XLIII*a*). For four picks of weft these only are crossed as in plain weave, over one, under one. Upon completion of the four picks, the Blacks are left down while the Reds are brought up to become warps. The alternation of Reds and Blacks for warps makes loose texture blocks of one color on the surface of the fabric, and long floats of the other color on the reverse side. In contrast to the 34 x 20 cotton yarns per inch in the basic web, the applied all-wool bands have 40 warps and 20 wefts per inch.

One of the Cahuachi fragments identifiable only by its style is entered here because of its similarity in design and technique to Cantayo specimen 171059. Cahuachi 171118e is a patterned band 1 $\frac{1}{4}$ " wide. Its center portion consists of a line of Red rectangles framed and centered with Black (Plate XLIII*d*). On either side are the usual Red and Black stripes. The set-up for the center alternates 2 Black yarns with 2 Red yarns, total 26. The manipulation of the warps is identical to that in specimen 171059; whatever warps are brought up are crossed in plain weave fashion by the weft; the remaining warps, of the contrasting color, are left inactive as floats on the reverse side (Plate XLV*a, b*).

Cahuachi kerchief 171226 (Plate XLIII*e*) has a much more ambitious pattern, but is technically the same as Cantayo 171059. The plain cotton web is bordered on each side with separately woven wool bands joined to it by stitchery. The bands have warp-loop fringes. The warp set-up for the stripes on either side of the patterned center is as follows: 4 Red yarns, 4 Yellow-Orange, 4 Red, 4 Dark Green, 4 Red, 4 Purple-Black. Next comes the set-up for the patterned portion: 2 Purple-Black yarns alternating with 2 Yellow-Orange yarns, total 34. The flat-view diagram, made from a reconstruction of the original, shows where the light yarns are brought to the surface to make the pattern, or are left down, inactive, while the dark yarns are brought up to form the background (Plate XLIV*b*). The interlacing is invariably over one, under one on the surface side. The inactive yarns whether pattern or ground yarns appear as very long floats on the reverse side.

The design motive in this pair of borders is the familiar Nazca bird with its bill in an open six-petal flower. The arrangement of the birds illustrates the conventional Peruvian double inversion involving reversal of the two opposing bird elements on a horizontal and vertical axis.

A pair of woven bands (Cahuachi 171225) are almost certainly kerchief borders. They measure 21 $\frac{1}{2}$ " by 1 $\frac{1}{2}$ ", are fringed at the ends with unwoven warp loops, and are patterned in a style similar to that of Cahuachi 171226, though not by means of the same technique.



As in the case of the other kerchief borders there are outer warp stripes of close-set yarns—Red, Yellow-Orange, Black—on either side of a central portion that is woven in Kelim tapestry technique (Plate XXXVIIIa).

In specimen 171225 we have one of the infrequent illustrations of weft-to-warp change (Plate LXVIII d). That means that when the warps were set up for the stripes, the two outside color groups—Red, Yellow-Orange, Black—were spaced far enough apart to allow for the center patterned portion of the band. Each weft crossed the first series of stripes, then the $\frac{1}{2}$ " space, and then the second series of stripes, regularly, as in ordinary plain weaving. The wefts crossing the space subsequently became the warps upon which flower motives in a dozen colors were woven in Kelim tapestry. The wefts may have been put in with sewing needles, judging by the fineness of the details. The quality of the band is fine, 44 warps by 20 wefts per inch. The tapestry yarns are single-ply and 2-ply wools.

Cantayo 171045, a fragment $8\frac{1}{2}$ " by $9\frac{1}{2}$ ", is put in the kerchief group because it resembles specimens in no other (Plate LVb). One feels that the piece must have been a small rectangle but there is no detail to give certainty. Like the surface find, "Nazca" *9120, the Cantayo specimen is patterned with allover embroidery. The motive is the familiar step-fret done with a double line of stem stitches in dark Brown wool yarn, probably natural color, the motives so arranged as to give prominence to diagonal lines.

The scalloped edge finish is of cotton yarn like the basic web except that wherever a dark line of embroidery comes to the edge, the scallop at that point is made with the dark wool yarn. The method of making the scallop detail can best be understood from the drawings in Plate LXVe, f, the former made from a reconstruction. The technique illustrates the ingenuity of the embroiderer, who could, as she did in this case, combine at will whatever devices in stitchery and weaving suited her purpose. She provided a foundation upon which to work the scallops by making a couple of circular loops of the sewing thread, and between the bottom half of this heavy circle and the edge yarns of the fabric itself she wove in figure-8 fashion. The turns at the top of the circle float across the scallop.

EARLY NAZCA APRONS

Two complete aprons and portions of two others comprise the material from which to draw generalizations as to this Early Nazca garment. Fortunately, the pieces come from three different graves, which gives some ground for assuming that the characteristic features are local rather than the result of an individual's fancy.

Cahuachi specimens 171181 and 171215 are plain weave, undecorated cotton rectangles of medium fineness. Strings or ties of approximately equal length and width extend from each of the four corners (Plate XXXIVa). There is a difference in length of one inch between those extending from the corners on the upper side, say, and those extending from the corners on the lower. Perhaps it is only a coincidence that the measurements differ to that degree on both specimens, or perhaps the method of wearing the garment regulated the lengths.

The Red needleknitted edge bindings on all the tie ends in the group seem to indicate a conventional finish. Those on apron 171181 and fragments 171267b are simple 5-loop bindings (Plate LXIII d). The ends of tie specimens 171223b and apron 171215 are more elaborate. The first has humming birds alternating with flowers, each tiny motive about $\frac{3}{4}$ " high, spaced approximately four to the inch (similar to motives in Plate LXIIa). The birds' heads which project from the bindings on apron 171215 are about $\frac{1}{2}$ " high, and each one is developed in four or five colors. Lines of contrasting color on the binding itself represent the tail feathers. Both of these specimens represent very fine needleknitting technique. The usual dozen or more colors are to be identified in the bird-flower bindings. The weaving yarns are 2-ply cotton. All the decorative yarns are 2-ply wools.

The tabulation shows the main technical features of this small group.

Specimen number	Complete length of web	Complete width of web	String lengths	String widths	Warps per inch	Wefts per inch
171181	37 $\frac{1}{2}$ "	15 $\frac{1}{2}$ "	27"; 28"; fr. 13 $\frac{1}{2}$ "; fr. 20"	2"	30	30
171215	44"	21"	35 $\frac{1}{2}$ "† 36 $\frac{1}{2}$ "†	4 $\frac{1}{2}$ " 5 $\frac{1}{2}$ "	40	36
171223b	.....	.....	34 $\frac{1}{2}$ "†	7"	30	32
171267b	.....	.....	fr. 2"	4"	34	34

† Two strings of this length.

THE MISCELLANEOUS GROUP

Practically every specimen in this group is in a fragmentary condition. As a consequence, the names chosen to distinguish one type from another are often purely descriptive. The particular uses of ancient Peruvian fabrics can be determined from their representations on the pottery, as Montell has so clearly shown us,³⁵ but it is difficult if not impossible to identify the smaller accessories of costume.

The variety of details, ornamental or purely utilitarian, which are brought together from the Early Nazca sites represented in the collection for analysis in this section can best be appreciated when they are listed: bands or ribbons, cords, nets, pads (for deforming infants' skulls as at Paracas?), wrappings, slings, a girdle (?), a scrap of feathered material, a scraper (?). In addition to the fact that there are these distinguishable types, there is also a wide range of techniques.

BANDS

To classify as bands the narrow, individually constructed specimens in the collection, it is necessary to include some fabrications not made by warp-weft interlacing. These are the twined and plaited specimens. The pieces to which the term has been applied are listed in the following table.

TABLE 27
BANDS: WOVEN AND FABRICATED BY OTHER TECHNIQUES

SPECIMEN NUMBER	LENGTH IN INCHES	WIDTH IN INCHES	TECHNIQUES			
			Woven	Plaited	Twined	Embroidered
170211d ¹⁻⁵	frags.	$\frac{1}{4}$	5	..	..	..
170211d ⁶	frag.	$\frac{1}{4}$	..	1	..	..
170465e	frag. 8½	$\frac{1}{2}$	1	..	..	..
170476c	frags.	$\frac{3}{4}$	..	..	1	..
170476d	frag. 8½	$2\frac{1}{2}$	1	1	1	..
170476e	frag. 8	$\frac{3}{4}$	..	..	1	..
171049	frag. 16	1+	..	..	..	1
171050	frag. 4½	$\frac{1}{2}$	..	..	..	1
171054	frags.	?	..	..	..	1
171109a ¹⁻²	mass	$\frac{1}{4}$	2	..	..	..
171109b ¹⁻⁴	frags.	$\frac{1}{4}$	4	..	..	..
171109c	frags.	$\frac{1}{4}$	..	1	..	..
171116b	frags.	$\frac{1}{2}$	..	1	..	..
171118a	frag. 17	$2\frac{1}{2}$	1	..	..	..
171118f ¹	frag.	$\frac{1}{8}$	..	1	..	..
171118f ²	frag. 14	$\frac{1}{4}$	1	..	..	..
171118f ³	frag.	$\frac{1}{8}$	..	1	..	..
171124a	frags.	$\frac{1}{4}$	1	..	..	..
171124b ¹⁻⁴	frags.	$\frac{1}{8}$	..	4	..	..
171124c ¹	frags.	$\frac{1}{8}$	..	1	..	..
171124c ²	frags.	$\frac{1}{8}$	..	1	..	..
171140a	frags.	1+	..	..	..	1
171140b	frags.	1+	..	..	..	1
171140c	frags.	1+	..	..	..	1
171227a	frag. 82	$\frac{1}{4}$	1	..	..	..
171227b	frag.	$\frac{1}{4}$	1	..	..	..
171238b ¹⁻²	frags. 80	$\frac{1}{4}$	2	..	..	..
171258a, b	mass	$\frac{1}{4}$	2	..	..	..
171280	frag. 14	5	1	..	..	..

³⁵ Gösta Montell, *Dress and Ornaments in Ancient Peru*, Archaeological and Historical Studies, Göteborg, 1929.

WOVEN BANDS

Cahuachi 171118a is the simplest of all the specimens in this group. It is a plain weave, cotton fragment, $2\frac{1}{2}$ " wide, 96 warps by 24 wefts per inch, with only its unusual closeness of weave and its Blue-Black color to give it character. It seems to have been used for binding, to judge by the sharp crease through the lengthwise center.

Majoro ribbon 170465e is the most attractive of the plain weave specimens in the group (Plate XXXVIIIb). It is in Kelim tapestry technique, of a very fine quality of workmanship, as may be judged by the warp-weft count: 26-28 warps by 176 wefts per inch. The fragment is complete as to width, $\frac{1}{2}$ ", but the count per inch is given in order to better contrast the quality of this Early Nazca tapestry with fine garment pieces of the Epigonal period: 46, 38, 58 2-ply cotton warps by 180, 216, 200 2-ply wool wefts per inch.³⁶ During this latter period tapestry weaving reached its technical peak. The drawing gives a good idea of the design motives and their arrangement. Lozenge shapes with the long axis running cross-wise seem a little unusual. The diamond motive is most often found in the twined pieces, and in them is always set lengthwise. There is a repeated sequence of four colors on the medium Rose (5 H 9) ground: Yellow-Brown (13 K 8), Dark Rose, Rose, Purple-Red (7 C 5). All the outlines around the figures are Brownish Black. One of the noticeable features in this specimen is the disintegration of the Rose yarn, leaving the warps practically bare. I do not recall other specimens in which this color has deteriorated. Usually it is the Blackish or other very dark yarns that fall from the web.

Cahuachi specimen 171280, a striped wool fragment, looks as if it were intended for a headband or girdle (Plates XXXVa, XXXVIIId). It is 5" full width, folded through the center, whipped together on the edges, and in addition has two heavy twists of yarn sewn to them. The wools used in the stripes, which vary $\frac{1}{4}$ "- $\frac{1}{2}$ ", appear to be natural colors: "White" (12 F 5), medium Brown (Adobe, 14 D 7), dark Brown (8 C 10 and also 8 E 12). The drawing gives a better idea of the end finish than words can.

Majoro band 170476d is the single example of double cloth in the collection (Plate XLIIa). It is double cloth of the standard type constructed of two independent sets of warps and wefts. The latter, in addition to crossing their respective warps, whether they be interchanged with the opposite set or not, turn about each other at the side edges, thereby locking the webs at this point. The simple design motives are rectangles the width of the band on a Rose (5 K 9) ground. Each motive is woven in three colors provided for in the warp set-up: 4 warps of Burgundy (56 H 9, which looks Black in the piece), 4 warps of Green (32 C 8), 2 warps of Gold (12 L 9). A single Rose yarn alternates with each yarn of any other color. When the Rose set is crossed separately, the web is monochrome; when the tri-color set is crossed, there are warp stripes. All the yarns are 2-ply wools.

Three short fragments in a combination interlacing-twining technique extend from the end of the 8" band. In reconstructing the technique it was feasible to begin with the interlacing which furnishes the foundation of the strand. It is not real plaiting, not a technique which makes a uniform strand if used alone, and yet it is not weaving either, since it requires but one set of elements (Plate XLIIg). Following is the series of movements for strands in positions 1, 2, 3, 4 (the strands shift from one side to the other, but each is identified by its position at the moment, not its original one): 3 over 2, under 1; 4 under 3, over 2. Those two movements provide a center for the twining strands, 6 to twine around strands 3 and 4, and 6 to twine around strands 1 and 2. Plate XLIIg shows how the lower member of a twining pair always comes up to the right of the upper member. It also shows the small

³⁶ Textile Periods, p. 45.

centers formed by the four interlaced foundation strands which are independent of the twining elements.

The three short lengths made by interlacing-twining, 16 strands in each, are brought together into one 48-strand flat plait. The technique is simple: single outside strands alternately the right, then the left, come to the center crossing over 4, under 4, over 3, with the left active strand always crossing over the right active strand. What gives the plait a complicated appearance is the cross striping. This, too, is simple, being dependent upon the initial placing of the strands coming from the three 16-strand interlaced-twined lengths. The colored yarns in each were arranged in the following order:

11 22 33 44 11 22 33 44 11 22 33 44 44 33 22 11 44 33 22 11 44 33 22 11

Majoro 170476d is only a fragment of its original length, but the remnant suggests that the band, whatever it was used for, must have been in the quality class of accessories. Even in its present state, it illustrates the fineness of Early Nazca double cloths, 16-strand interlaced-twined braids, and a 48-strand plait of unusual color arrangement.

Cahuachi specimens 171109a¹⁻² represent a type of narrow weaving to which has been given the name "turban band" (Plate XLc, f). What the original length of these specimens was, and on what form or foundation they were shaped for wearing can only be conjectured. Specimen 171109a¹ is literally a formless mass of material, measuring approximately 25 yards. Specimen 171109a² consists of three bunches, each in form resembling a festoon. The best-preserved is 9" across approximately, composed of a group of 34 separate wool tapes wound around at intervals of 12", 16", and 20" from one end with wool strands to hold the group together.

The construction of these turban bands is by plain weaving, but done so ingeniously as to create a unique result. There are only two warps and six wefts, 2 Red, 2 White, 2 Blue (171109a¹). The interlacing over the two warps is regular, but it is done by each of the six wefts in turn: Red, Red, White, White, Blue, Blue. This brings all to the same side of the warps. On the return to the opposite side, the last weft across becomes the first, and the order is Blue, Blue, White, White, Red, Red. The drawing shows the scalloped edges which result. Imagine this a quarter of an inch wide and correspondingly thick.

Specimen 171109a² is identical except for the colored wefts: Green, Brown, Red.

Striped Turban Bands.—The seven remaining specimens listed in the column of woven bands are alike in technique: narrow set-ups of wool warps, the odd-numbered of one color, the even-numbered of a contrasting color. Plain weaving brings up all of one color on the first pick, all of the contrasting color on the second pick, and so on alternately. Crosswise stripes are the result. The weft elements are of three types:

(1) A single weft element consisting of a 2-ply wool yarn or a doubled 2-ply yarn crosses from side to side regularly (Plate XLb), as in specimen 171227. Such wefting produces a thin turban band.

(2) A pair of weft elements which enter the shed separately, one from each side, passing each other and exchanging positions. Specimen 171124a has a warp set-up of Yellow and Red yarns, but the two Green-Blue wefts form visible color lines on the side edges.

(3) Two pairs of wefts of different colors work in this manner: when the odd warps are raised, the pair of one color enter separately from opposite sides of the web, passing each other in the shed. On the next pick, when the even warps are raised, the pair of the second color enter separately from opposite sides of the web, passing each other in the shed (Plate XLa). Besides involving three more weft yarns than the first method does, and making

the turban band thicker, the edge is given added strength and decoration. Specimen 171118f² has Red and Brown warps, and pairs of Red and Brown wefts.

The turban bands with crosswise stripes are of fairly consistent quality. The warp-weft counts are approximately 10 or 11 by 2 or 3 for the quarter inch width, equivalent to 40-44 by 12-14 for the inch.

The colors, also, are within a narrow range. Following the plan adopted for other subgroups in the collection, the tabulation shows the combinations which seem to have been favored by the Early Nazca weavers of turban bands. None of the colors is unusual. The Reds tend toward Purple or Orange, the Oranges are similar to Gold or Tan, the Greens are very dark, or Blue-Greens, and the Blues deep and rich. There are no Purples, and no pale colors of any group.

TABLE 28
TURBAN BAND COLORS

SPECIMEN NUMBER	WARPS					WEFTS
	Red-to- Orange	Orange-to- Yellow	Yellow-to- Green	Green-to- Blue-Green	Blue-Green- to-Blue	
170211d ¹	.....	8 H 10	24 J 11	.....	.....	24 J 11
170211d ²	7 L 2	.....	.....	31 H 6	.....	7 L 2
170211d ³	6 K 9	.....	.....	.....	39 E 8	6 K 9
170211d ⁴	7 L 2	12 L 11	.....	.....	.....	7 L 2
170211d ⁵	.....	12 L 8, 8 H 10	.....	.....	.....	8 H 10
171109b ¹	.....	8 H 10	24 J 11	.....	.....	8 H 10
171109b ²	7 L 2	.....	.....	31 H 6	.....	31 H 6
171109b ³	6 K 9	.....	.....	.....	39 E 8	6 K 9
171109b ⁴	7 L 2	12 L 11	.....	.....	.....	7 L 2
171118f ²	7 L 2	8 H 10	.....	.....	.....	7 L 2, 8 H 10
171124a	6 K 11	12 L 7	.....	.....	.....	31 H 6
171227a	6 K 11	.....	.....	31 H 2	.....	31 H 2
171227b	6 K 11	12 L 8	.....	.....	.....	12 L 8
171238b ¹	6 K 9	.....	.....	31 H 2	.....	6 K 9
171238b ²	6 K 11	12 L 8	.....	.....	.....	12 L 8
171258a ¹	6 K 11	.....	.....	31 E 5†	.....	39 E 8(?)
171258a ²	7 L 2	.....	.....	.....	39 E 8	7 L 2

† Warps originally 39 E 8(?) faded to 31 E 5.

PLAITED BANDS AND CORDS

The ancient Peruvians knew many different types of plaits, flat, round, and square. They knew, also, how to use few and many strands in their making, but until more study is made of the slings, especially, we shall have to conjecture that the main object in multiplying the number of strands was to strengthen the plait, and that the addition of colored strands was incidental. That is, in comparison with the variety of plaited fabrications in the collections, the ones that evidence interest in combining colors are definitely in the minority. One-color plaits are most common, two colors are much less often found, although typical of the 4-strand round braids. Three or more colored yarns in the same plait make it unusual. For that reason the two types of interlacing and plaiting already described for Majoro 170476d are important as showing this form of technical achievement in the Early Nazca period (Plate XLII*f, g*).

The turban bands illustrating plaited work as listed in the tabulation of band types (Table 29) total eleven. There are no square plaits in the collection. These seem to have been the particular contribution of the Late and Inca technicians. But there are flat and round plaits with the 3-strand flat, our own most common variety, represented by only three examples.³⁷ One of them is, however, the single example of a 5-color braid (171116b),

³⁷ Textile Periods, p. 33, footnote 20.

probably a fragment from some decorative detail. The colors are the familiar ones: Orange, Blue, Cream, Red, Green. The second 3-strand flat is the result of grouping 9 strands into 3's (171118f¹), and the third example is suspect. The present 3-strand plait on specimen 170476f¹ was originally a 4-strand, in all probability, but lost its dark strand of wool through deterioration. It is represented in Plate XLIIb as a 4-strand, to match the companion plait in the S-shaped appliquéd motive.

TABLE 29
PLAITED TURBAN BANDS: NUMBER AND COLOR OF STRANDS

Specimen number	Flat braids; number of strands	Round braids; number of strands	Strand colors
170211d ⁶	8	..	Red
171109c	8	..	Red
171116b	3	..	Orange, Blue, Cream, Red, Green
171118f ¹	9, 3	..	Red
171118f ³	..	4	Yellow, Brown†
171124b ¹	..	4	Red, Green
171124b ²	..	4	Red
171124b ³	..	4	Yellow, Brown
171124b ⁴	..	4	Blue, Brown
171124c ¹	7	..	Yellow
171124c ²	4	..	Yellow

† Yellow and Brown probably natural color of wools.

The 4-strand round plaits are almost invariably in two colors. One method of making is to place the two pairs of colors in order: Red, Red, Green, Green, in positions 4, 3, 2, 1 (Plate XLIIc).

First step: Pass the active element in position 1 under strands in positions 2 and 3, and back over strand 3. The active element is now in position 2.

Second step: Pass the active element in position 4 under strands in positions 3 and 2, and back over strand 2. The active element is now in position 3. Repeat steps 1 and 2.

The 4-strand flat plait represents very simple interlacing: the outside right strand crosses its neighbor to the left; the outside left strand crosses its two neighbors to the right (Plates XLIIb, LXVIIIa; the latter is an unusual use of plaiting as a closing of a seam).

The 7-strand flat plait is also simple interlacing: the outside right strand always passes to the left under 2 strands, over 1, under 1, over 2 (Plate XLIIId).

One type of 8-strand flat plait (specimen 170211d⁶) has a single active element, the outside right strand. Each strand as it succeeds to this outside position at the right, passes consistently over 2 strands, under 2, over 1, under 2, to become the left strand (Plate XLIIe).

The 9-strand flat plait (specimen 171118f²) has two active elements, the outside right and the outside left strands. Each passes to the center, first the right one, under 2 strands, over 2 strands; and then the left active element, under 2 strands, over 2 strands, one of these last being the former right active strand (Plate XLIIh).

WARP-TWINED FABRICATIONS

Small all-wool fragments, Majoro 170476c, e, represent a class of materials of which we have comparatively few examples. Twining is familiar as a basketry technique, but in basketry the weft elements are active. Weft twining has already been described in connection with the decorative yarn finishes on tunics 171217a and 171308 (Plate LXb). The loom with its warp yarn held in position does not lend itself to the construction of fabrics in which it is necessary to twist one warp yarn completely around another. Twining

is not to be confused with gauze weaving, which it resembles superficially. In the latter the active warp of the pair shifts from side to side, makes a half turn, but never encircles the passive warp.

But if the present Early Nazca collection contains only small fragments of bands in warp twining, it is probable that more and varied pieces will be made available for study at a later date. The technique was surely well known to the Early period weavers. A small group of fabrics from three Paracas Caverns graves furnishes two good examples.³⁸ Complete measurements can be given for Paracas Caverns specimen 8430. Held without stretching, it is about 52" long by 22" wide. The description as given in the *Revista* is as follows:

"There are two very heavy loomstrings at either end. This suggested that the two-ply wool yarns might have been stretched in some sort of frame. It was found possible to duplicate the effect although as in all reconstructing of old techniques it is impossible to state with certainty that the method used duplicates the ancient method of fabrication.

"In the twining technique, pairs of warps work together, separating to form units of a new pair, and, in this particular type of twining, coming back to their original position after a set number of twists (fig. 33). Any twist of one yarn about another at one end of a group of yarns held in a definite relation to each other, is duplicated in reverse at the opposite end. Since this is so, two meshes in the fabric are built up with each set of twining motions, and the actual work need progress only to the mid-point of the piece. At this point the problem is to keep the whole web from loosening and untwisting to its original state of plain stretched warps. In both specimens, when the twining turns from each end had approached to within an inch of each other, the fastening of the twists was made secure by "chaining" the yarns from one side edge to the other. With the series of yarns still held taut, pair number one was extended over pair number two and number two was pulled through the loop formed; pair number two was extended over pair number three and those yarns pulled up through the loop, and so on. The effect is a ridge of chain loops through the center with the pattern and ground meshes diverging in opposite directions from the ridge."

To return to the Nazca fragments, specimen 170476e is the simpler of the two (Plate LIIIa). It consists of pairs of dark Green (32 C 8) and Yellow (12 K 9) yarns in order, Yellow (1 pair), Green (4 pairs). The actual number of units, I should judge from a reconstruction of the technique, is not important except that sufficient must be provided for the desired width. The arrangement of units at the center is reversed as follows:

YY GG GG GG GG YY YY GG GG GG GG YY

The right-hand Yellow element always turns over the left-hand Yellow element, but in manipulating the two pairs of Green, the effect of counterpairing is given by twining the inside elements (2 and 3) away from the center and over the outside elements (1 and 4). Between each two turns of any single active pair anywhere in the piece a passive pair is enclosed. The chevron pattern is formed by the appearance and disappearance of the pairs of Yellow twining elements. How closely these twined yarns were set may be appreciated by the width of the bands, $\frac{3}{4}$ " complete.

Majoro specimen 170476c (Plate LIIIb) requires a set-up of 52 pairs of Green, Yellow, and Red yarns in the following order:

G Y G Y G Y G Y G R R R R G Y G Y G Y G Y G R R R R—center

This brings us to the center of the $\frac{3}{4}$ " band, and to a reversal of the order of the yarns. There is nothing difficult about the actual manipulation of the strands in twining. Working

³⁸ Tejidos del Periodo Primitivo de Paracas, *Revista del Museo Nacional*, vol. 1, pp. 60-80, Lima, Peru, 1932.

with long strands of twining yarns probably necessitated winding the ends into small balls to keep them from tangling. Or perhaps the twining at one end of a band of stretched warps duplicated itself at the other end. The placing of the colors results automatically in the production of lozenge shapes if the twining itself is correctly done. That is, it is possible to form diamonds of Yellow and Green, one within the other, only if the active Green pair, for instance, is active only so far as is necessary to form the side of its own diamond. When a corner is reached, the active twining pair must become passive, must be enclosed within a pair of yarns of the contrasting color. The drawing shows the changes each pair of strands makes in producing lozenge shapes.

EMBROIDERED BANDS AND GARMENT FRAGMENTS

Cantayo 171049, a fragment 16" long by 1 $\frac{1}{8}$ " wide, was originally completely covered with rows of stem stitchery (Plate LVIIb). The stitch is one of the simplest in the embroiderer's repertory, and is usually made without variations. If the thread is always kept either above the needle or below it, the surface of the embroidery takes on a twilled effect (Plate LXg). Specimen 171049 has stitches of uniform length, taken over 4 warps or wefts, or their equivalent, depending upon the direction of the line. Since the warp-weft count of the cotton foundation band is 38 x 24 per inch, the wool embroidery surfacing is of fine quality. The ground is an Orange-Red (6 H 10), the motives similar to catfish(?) in Khaki Yellow (13 J 7), Yellow-Green (15 H 4), and dark Green-Blue (40 E 3).

Cantayo fragment 171050 is also embroidered in stem stitchery which completely covers the cotton foundation (Plate LVIIId). The work is even finer in this specimen than in the last due to the finer warp-weft count, 42 x 34 per inch. Lengths of stitches vary, floating as they do over 2, 3, and 4 foundation yarns. The ground is Rose Red (6 I 9). The design motives are block-S forms, about a half-inch high, and slanting at an angle of 45°. One complete repeat and a remnant of a second indicate a sequence of six colors: dark Green, Yellow, pale Green, Purple-Red, Yellow-Green, light Rose. Part of the second sequence has been lost in the deterioration of the wool yarns, but colors in the 3rd, 4th, 5th, and 6th places remain. Just beyond the solid embroidery on one long edge there is a line of small plant-like motives which give the effect of tabs. Each detail on these is made by a single stitch.

Cantayo specimen 171054 consists of very small and fragile bits of embroidered bands, probably neck or armseye trimmings. What is left of them shows that they are similar to the better-preserved pieces described above: a fine weave cotton foundation material, which also gauges the quality of the embroidery, since it was customary to count the yarns for the stitches by twos and fours; small design motives made up of spirals and circles (possibly a flower), and at least four colors counting the Black outlines to the motives. This specimen illustrates one of the stem stitch variations: the stitches on one row have been worked with the thread consistently thrown above the needle; in the next row, the thread was kept below the needle (Plate LXf). The counterpairing produces a very different effect from the usual twilled surface of solidly worked stem stitches.

The four specimen numbers, Cahuachi 171140a, b¹⁻², c, cover from 90-100 small bits and shreds of embroidery, the largest of which measures 5 $\frac{1}{4}$ " by 2 $\frac{3}{4}$ ", but they represent the finest stitchery in this Early Nazca collection. It is inevitable that they should remind one of the Paracas Necropolis embroideries both in their technical and design features, and an analysis of the fragments indicates the stylistic similarities between the embroideries from the two sites.

Although these embroidered bits are listed under 171140a, b¹⁻², c, the four subdivisions will be treated as one since each contains a similar assortment of fragments. That is, frag-

ments in each of the four are wool embroidery on cotton foundation webs, and wool embroidery on wool foundation webs. The Paracas garments are also very often combinations of separately woven cotton and wool materials embroidered in the same designs. But these Cahuachi all-wool remnants represent a style different from any Paracas style with which I am familiar.

Dividing the fragments on the basis of foundation materials, we have evidence of two different garments, one Brownish-Black cotton with an embroidered border seamed to its edge, and the other White cotton with allover embroidery. There is a possibility, of course, that these two were originally parts of the same garment, but that seems unlikely.

The Brownish-Black cotton fragment, about $2\frac{1}{2}$ " by 2", is a plain weave, warp-face material with yarn count 88 x 30 per inch. To its side selvage is whipped a shred of a Red wool embroidered border. This border is composed of three narrow bands, each separately woven, embroidered, then seamed together (Plate LVIIa). There is no doubt that the three parts were planned for this specific purpose, but why they should have been made separately is inexplicable. The two $\frac{3}{4}$ " bands are warp-face set-ups of Red and Black warps (count 48 x 30 per inch), the Black yarns making narrow stripes near the outer edges. The embroidered motives on these are germinating seeds, a familiar design element on Nazca pots and on Paracas Necropolis garments. The $1\frac{1}{4}$ " center band is plain weave Red wool (count 40 x 40 per inch) embroidered with a series of birds and monsters with protruding tongues. The stitchery is the very simple stem stitch with thread consistently kept below the needle. The surface has the usual twilled effect.

The group of fragments which seem to me to belong to a second garment or detail are equally well executed although a trifle coarser. This is due to the fact that the cotton foundation material, by contrast with the wool, has a yarn count of 32 x 32, and that stitches which float over four such yarns are of necessity longer than those that float over four smaller yarns in a cloth of higher count. The fragments suggest that the cotton garment was edged with tabs of at least three sizes and two types. The two larger sizes were 2" deep by $2\frac{1}{4}$ " wide, and $1\frac{1}{4}$ " deep by 2" wide. The colors and motives seem to be the same. Tabs like these may have been made on the side edges of a web by using a skeleton warp (Plate LXVb). The regular wefts might then have extended out and around the skeleton. They would in turn become warps upon which to weave the tabs, a method suggested in the drawing. Or the tabs may have been made on the regular warps. The Paracas weavers made tabs on the ends of webs by adapting the Kelim tapestry technique to this use (Plate LXVb). Neither of these suggestions has been entered in Basic Table 30. Dissection proves that the Cahuachi tabs have three side selvages. They are bound with 3-stitch needle-knitting (Plate LXIIIe).

The small tabs vary in size, but measure a little less than 1" by $\frac{3}{4}$ ". They are made of rows of buttonhole stitchery, 28 stitches by 28 courses per inch (Plate LXVa). The colors are the familiar embroidery and needleknitting colors: Reds (1 J 9 and 5 L 11), Brown (15 C 10), Greens (16 L 12, 23 E 5, 32 J 6), Blue (39 H 3). The Blacks are dark Greenish and Brownish-Blacks.

By contrast with the quantities of sumptuous embroideries from the Paracas Necropolis these scanty bits from Cahuachi make a poor showing. It is not reasonable to suppose, however, that they represent the only fine work from the region. No doubt the original garments from which specimens 171140a, b¹⁻², c, came were unusual, but they need not be considered unique. Except for the joining together of the separately woven embroidered bands, which may indicate a weaver's personal preference, the basic materials, embroidery

techniques, quality of workmanship, coloring, and design motives approximate the elaborate style of the Paracas Necropolis garments.

CORDS

This name is arbitrarily given to three specimens: an example of 4-stitch tubular needleknitting, a 2-strand fragment of natural color maguey(?), and a flattened tubular piece made by an ingenious variation of a simple weaving technique.

The 2-strand cord (Cahuachi 171124d) is just such a fragment as might be found among the useful binding materials of many a modern Indian group. In making the Peruvian specimen, approximately 16 single plies were twisted together, then doubled. Doubling preserved the twist for each ply, and gave twice the strength to the cord.

The needleknitting fragment (Majoro 170476f²) was made in the same manner as has been described in the section on plain weave striped mantles with needleknitted edges (Plate LXVc). It consists of a core veneered with rows of stitchery which are worked round on round. In offering an analysis of the method of making the tail feathers and plant stalks of Cahuachi bird-flower fringes, the core was described as a twisted foundation strand of cotton. This extra element seemed necessary to furnish a little more body than a wool core of the same size could furnish. But, in the Majoro specimen, wool yarns of four colors are used alone. Each strand is active in its turn in forming the striped pattern, and while it is active the passive three serve as core.

The Majoro fragment is only about four inches long, but that length is sufficient to illustrate one of the most interesting features of Peruvian color use: the combination of an unbroken repetition of three colors—Green alternating with Red and Yellow—and a simple repetition of two unit sizes— $\frac{1}{2}$ " repeated twice and $\frac{1}{8}$ " repeated twelve times. In the following, the repeated letters standing for the colors give an approximate effect of the result:

GGGG RRRR G Y G R G Y G R G Y G R GGGG YYYY G R G Y G R G Y
G R G Y—repeat

The flattened tubular piece, Cahuachi 171180c, is a wool fragment $8\frac{1}{2}$ " long by about $\frac{3}{8}$ " wide. It is made of fine yarns, approximately 40 x 22 per inch. The weave is, for the most part, plain, although there are places in some of the design repeats where warp yarns float over two weft picks. The small rectangular motives suggest bird forms (Plate XLc). They are all alike, about an inch or more long, and appear on an Orange ground. The design areas in each rectangle are approximately the same, but the same colored yarns do not appear in adjacent motives nor do they appear in any two motives developing simultaneously on opposite flat sides of the tubular cord.

The reconstruction from which Plate XLd was drawn does not pretend to duplicate the actual area shapes of any of the partly deteriorated motives in the specimen. It demonstrates the technique by which such motives could have been woven. The warp set-up included 8 Orange yarns for each rounded edge, and 12 for each flat side, 40 in all. Then, to judge from appearances, there were 24 of each of the colored yarns used in the motives: Cream, Rose, Blue, Black. These 136 warps must all have been held taut and kept crowded together. A continuous Orange weft yarn wove over one, under one, spirally, enclosing the whole warp group. In reconstructing the piece I brought to the surface all the Orange warps and passed the weft under and over them alternately as in plain weave. Two such rounds of the weft made the solid color Orange bar between each two motive rectangles. In the Majoro specimen, each color area is outlined with Black. The drawing of the reconstruction does not show any outlines, but simply how by leaving the Orange yarns down,

any other desired warp color could be brought up from the encircled group to appear on the surface for as few or as many of the picks of the weft as was desired. Red seems to be part of each design motive, exchanging places from one flat side of the tube to the other with Blue and Cream. There is nothing complicated or difficult about the technique itself, but as Crawford has said, "of all weaving tricks tubular weaving seems the most unlikely for the primitive craftsman to stumble upon. Today the most common example of this class is the pillow slip. Yet in the Peruvian collection . . . we find a narrow tubular ribbon in which the warps of great variety of color produce design. In order to make the texture solid the colors on one side have been drawn through to make designs on the other. This is an application of the principle of double cloth weaving."³⁹

SLINGS

Cahuachi specimens 171289a-g are slings and fragments of slings combining maguey and cotton. There are an intact specimen (Plate XLVIIIa), 2 more or less complete specimens bound together with their own cords, 2 intact maguey centers and 2 fragmentary centers, a finger loop and cord. Total: 3 slings; 4 identifiable center fragments. The remnants evidence that the slings were all practically alike in appearance. The 7" centers consist of two flat plaits of maguey fibers brought to a point at each end by a wrapping of 2-ply cotton cord. Stout 3-ply cotton cords about $\frac{1}{8}$ " in diameter were also included in the wrappings. One of these 2- or 3-ply cords ends in a plaited finger loop of Blue, Yellow, and White wool yarns. The other cord ends in a flat plait "handle" of cotton. The three specimens on which these parts are intact are wound around with their own cords.

Technically speaking, the slings are simple. The central, maguey portion is plaited by a method which can use any even number of strands (Plate XLVIIIc). Whatever the number chosen the strands are divided into two equal groups. The outside right strand crosses all of its group to the center; the outside left strand crosses all of its group, and also the former outside right strand. These two movements alternate without change. The result is a smooth plait over a core which is thin or thick according to the number and size of strands chosen. The center plaits of all the sling fragments are about $\frac{1}{2}$ " wide by $\frac{1}{8}$ "- $\frac{1}{4}$ " thick.

The finger loop by which the sling was held upon release of the stone is a flat braid $\frac{3}{4}$ " wide. The loops on the two intact slings are alike in being bound to the ends of the hard 3-ply cords by wrapping, perhaps with the single plies of the cords themselves. The color effect of the loops—dissection of the specimens did not seem justified—can be gained by plaiting 32 strands with colors in the following order: 1-1-2-2-1-1-3-3-1-1-2-2-1-1-3-3, and reverse.

The series of crosswise herringbone stripes is made by working alternately first with the outside right, then with the outside left strands: right over four strands, under three; left over four strands, under four, including the former right strand. The effect is similar to that shown in Plate XLIIIf.

The "handle" on one of the bound slings (171289a) seems to be of considerable length. It is formed of a thick group of long cotton yarns held by its center in the twist made by doubling the end cord (Plate XLVIIIb). The cotton yarns are then plaited into a 4-strand round plait as described in the section on turban bands and shown in Plate XLIIc.⁴⁰

Cahuachi 171314 is a sling entirely different in type from the maguey-cotton slings (Plate XLVIId). It is incomplete, without a hint of the lengths or forms of end finishes,

³⁹ M. D. C. Crawford, *Peruvian Textiles*, Amer. Mus. Nat. Hist., Anthr. Papers, vol. 12, p. 95, 1915.

⁴⁰ Compare with maguey sling from the Early period at Paracas, described and pictured by E. Yacovleff and J. C. Muelle, *Revista del Museo Nacional*, vol. I, p. 48.

but a change in the color of the yarns at one end indicates that there was a finish. The length, originally, was over 60", but how much over depends upon whether the two smaller fragments are parts of one end or two.

Specimen 171314 is made of all-wool yarns, natural light Cream and dark Brown, probably llama wool, and dyed Yellow and Red. The center is in Kelim tapestry technique too fine in quality for the rope-like ends. The design is geometric, a series of hollow squares with stepped frames set diamond-wise, the spaces between them spanned by bars of the same Yellow. Where all the warps are constricted near the ends, the weave changes to plain striped tapestry.

These same center portion warps are merged with the active elements in forming the rope-like ends. The technique used is called wrapped weaving, a term taken over from basketry.⁴¹ In the sling each warp element makes a single turn around a spiralling weft element by going down on the far side of the weft, and coming up on the near side. The same technique with change in the number of yarns or strands passed over is the stem stitch of embroidery already referred to many times. The semi-realistic serpent design on this sling is given added interest by the manner in which the dark and light blocks spiral around the rope. The smaller ends of the ropes are done in the same technique but the motive is simplified to zigzag lines. Remnants of Yellow and Red yarns on one fragment end suggest tassels or deep fringe.

NETTING

Two netted specimens, Cahuachi 171118g and 171118h, illustrate the two simplest methods of constructing this type of fabric: knotless netting, or half-hitching, the coil without foundation of basketry; and the netting with simple or finger knot (Plate LXVg, h). The meshes in both specimens are about 1½" square. The cord used is a coarse cotton. Specimen 171118h is made of 2-ply white cotton, each ply formed of many smaller yarns.

FEATHER BANDS

A single specimen (Cantayo 171071c) illustrates the use of feathers in Early Nazca times. The condition of the material is bad, the cloth is charred, and the feather bands in bits, but something of the quality of the garment upon which the bands were sewn is indicated by the warp-weft count, 40 x 40 per inch. The yarn is 2-ply white cotton, and the weave plain.

The bright Yellow feathers are held by two strings knotted about them in exactly the same way as are the feathers on Late Ica specimens (Plate LXVIb). The band of feathers thus formed measures about an inch in depth and is applied to the garment material, sometimes making a solid color ground, at other times forming patterns. The Early Nazca specimen is too badly deteriorated to indicate the original plan of coloring.

WRAPPINGS

Two complete four-selvage pieces come under the classification of wrappings, the main points concerning which are entered in the following tabulation:

	Cahuachi 171306	Cahuachi 171312
Length.....	10' 4" (full)	8' 9" (full)
Width.....	36.5" + 38.5"	30"
Weave and texture	plain; like canvas	plain; like crash
Warp-weft count.....	38 x 28; 44 x 32	22 x 20
Yarn composition.....	2-ply white cotton	2-ply white cotton
Loomstrings at ends.....	3-ply white cotton	4-ply (each 2-ply) Blue cotton

⁴¹ O. T. Mason, *Aboriginal American Basketry*, U. S. Nat. Mus., Reports, 1902, pp. 230, 231, figs. 13, 14, 1904.

PADS

There are three specimens in the Early Nazca collection which seem best described as pads. Two of the covers, Cahuachi 171236 and 171279b, are about the size of the kerchiefs, and suggest an additional use for small squares or rectangles of material. The third (Cahuachi 171330) is a bag 10" by 6" in size (web 20" [?] by 12" [?] as woven), filled with loose cotton fibers. Coarse whipping stitches made with a doubled 2-ply cotton yarn close the edges (Plate XXXVd). The weave is plain, of 2-ply brown cotton, count 24 warps by 24 wefts per inch. The texture is similar to canvas.

Cahuachi specimens 171236 and 171279b come under the pattern weave classification. They are similar in technique to fragments allocated to the mantle group (Cahuachi 171218b and 171279a). Like the mantle fragments, these pad covers are plain weave plaided fabrics within which the weaver has developed patterns by warp and weft floats on the surface side. The set-up for pad 171279b consists of repeated units of warps: 6 Green, 2 White, 6 Green, etc. (Plate XLVIa). The colored wefts cross in exactly the same order, 6, 2, 6, etc. All the floats on the surface of the material are white. Those which extend horizontally are made by the White weft floating or flushing over the whole group of 6 Green warps at the proper intervals. The vertical White floats on the surface of the material are made by the Green wefts floating under the White warps at intervals. The particular intervals chosen by the weaver for specimen 171279b result in stepped diagonal lines (Plate XLVIb, c).

Specimen 171236 is simpler, technically, because the pattern area is small. Plate XLVIe, f, shows the four small crosses in the center, and the detail in Plate XLVI d gives the warp-weft interlacing. Three colors—White, Brown, and Pink—are set up as follows: 3 White, 4 Brown, 2 Pink, 4 Brown, 2 Pink, 3 Brown, 2 Pink, 4 Brown, 2 Pink, 4 Brown. Wherever lengthwise or crosswise lines are required to develop the motive shape, they are produced by floats brought up out of the background plain weave.

Both specimens are approximately square: Cahuachi 171236, 15½" x 17"; Cahuachi 171279b, 15½" x 15½". The first one, fairly fine in texture, is folded over a small rectangular bat of loose cotton (Plate XXXVb, c). The bat is kept in place by knotting together the opposite diagonal corners. Cahuachi 171279b has small bits of cotton adhering to it as if the cotton had fallen out of place, but it is not folded or knotted.

STONE WOUND WITH STRING

Cantayo specimen 171071e is a stone wound around with cotton cord which possibly formed a protection for the hand, or allowed for a better grip. After the lateral strands were placed, crossing strands were put in which twined and half-hitched at their intersections with the first set. The cord used is 2-ply white cotton, hard twisted. Each of the two plies is composed of nine double-ply yarns, a total of thirty-six single yarns in the cord.

SUMMARY

GARMENTS

Garments of whatever size are composed of one or more rectangular pieces with selvages on all sides, proving that each web was woven on a separate set-up of warp yarns. The tunics were seamed under the arms, but the mantles, kerchiefs, and aprons were draped or tied on the wearer. There is no evidence from these Early Nazca specimens that any altering of the rectangular web was done by cutting, or that garments were woven to shape as we find them in Late periods. The smaller articles in the collection were doubtless accessories, ribbons, bands, and cords. They illustrate a variety of weaving and plaiting techniques (Table 27).

TEXTURES

These vary from filmy, gauze-like materials to heavy canvas-like fabrics. The former were occasionally woven with yarns so tightly spun that upon release from the maintained tension of the loom the webs contracted, resulting in a *crêped* surface. As a whole the specimens reveal expert handling of yarns. The edges are even, the number of wefts per inch is fairly consistent no matter where the count is made, and the final few inches of weaving are not noticeably looser than that in other areas. A good many of the specimens are similar to our muslins, a term which can be applied to a wide range of plain weave cotton cloths.

DECORATIVE FEATURES

Textile patterning is of two types: structural and superstructural. The first classification covers those decorations which develop during the fabrication of the web in the loom. When the web is taken from the beams, it is complete. Whatever embellishment is applied after its removal is classed as superstructural. Many of the Early Nazca textiles show decorative features applied subsequent to the weaving, often in addition to the structural features.

The structural type of decoration is found mainly in those weavings which incorporate colored yarns in their warps, or wefts, or both. The striped mantles, pattern weaves, tapestry, double cloth, and single-element fabrications are all examples. There is at least one structurally decorated specimen on each of the first twenty plates.

A type of decoration, literally superstructural because the pattern wefts are not functional to the basic web, is illustrated by the brocades (Plates XLIX–LII).

The superstructural decorations are mainly in the form of embroidery. Other types are too few to reckon with. Fringes, tassels, needleknitted cords and edge trimmings of the *passementerie* order, scallops, and various stitchery techniques still in use among embroiderers appear on the several garment types.

Design Elements.—These, as is to be expected, are governed partly by the imposed limitations of the chosen techniques. Usually, motives woven by primitive craftsmen are geometric motives. All the familiar elements, together with the characteristic stepped-fret (Plates XLI, LV), are represented in the collection. In addition, the pattern weave, considered difficult to manage, was nevertheless sufficiently developed in the Early Nazca period to use for curvilinear motives (Plate XLIIIe).

Needleworked patterns show greatest range in form. The stylized bird and serpent(?) motives in specimen 171220 (Plate LIIc, *d*), the human heads (Plate LXIh–j), and, most

realistic of all, the complex bird-flower fringe trimmings are characteristic of this period. Embroidery in Early Nazca is not heavy, except where used for edges. The mantles with warrior motives (Plate LVIII), flower motives (Plate LIX), and monsters (Plate XXXIXd) are patterned with solidly worked motives, but the techniques do not produce embroidery out of scale with the fabric weights.

COLORS

Colors in Early Nazca fabrics have been dealt with in detail. It is only necessary at this place to restate the fact that 190 separate hues were discovered through matching 350 yarn swatches to the printed samples in Maerz and Paul's Dictionary of Color. Even if half the colors found represent accidental results the range would be admirable. There does seem to have been a deliberate attempt to make medium and dark dyes in a majority of the colors. For instance, the two striped wool mantles (171262, 171265) are woven with two closely related Reds. A number of the embroidered pieces show a decided preference for Slate Blues and Reddish Purples. Since these colors are rare in Peruvian textiles as a whole, they can be regarded as criteria in placing textiles within the Early period.

Evidence of interest in color sequences is not lacking, but by comparison with that shown in textiles from the Paracas Necropolis, the interest at Nazca was less. Of the two examples of allover patterning, kerchief *9120 and flower mantle 171222, the latter is most nearly like the typical Paracas mantles. Not in technique nor in motive does the Cahuachi example resemble a Paracas one, but in the variety of colors and their arrangement (Plates LVa, LIX).

The needleknitted bird-flower specimens, although employing the largest number of colors, do not show sequences, although one of the simple fragments in the technique holds to a characteristic 1-2-1-3 order (170476f²). In later periods, needleknitting became formalized in use, and its color sequences were strictly maintained.

YARNS AND TECHNICAL PROCESSES

The summary statements regarding techniques common to all specimen types in the Early Nazca collection follow the order as given in Table 30.

YARNS

The Preliminary Report dealt with 117 Early specimens among which the all-cotton, all-wool, and cotton-wool combinations were in percentages as 34 : 34 : 32. The present study involves 163 specimens with the three groups in percentages as 31 : 36 : 33. Reasons for the difference in the number of specimens were given in the Introduction. The majority of those added by subdivision on a color basis were woven and plaited turban bands which fell in the all-wool category.

It is of interest to note that in only one woven specimen in the whole collection, the interlocking warp and weft patchwork fabric (171111), is the wool-cotton yarn combination visible. The plaited slings (specimens 171289a-g) also show the two types of yarns as well as maguey. Cotton foundation materials, either woven as tapes or needlemade in the desired shapes, are assumed for all the needleknitted specimens. Decorative garment features such as woven motives or embroidered edge trimmings are almost invariably wool, regardless of the yarns forming the basic web to which they are applied.

WARP-WEFT TECHNIQUES

Five of the eight standard weaves known to modern weaving were known to the Early Nazcans: plain with tapestry and interlocking variations, double cloth, pattern weave of

several varieties, gauze, and brocade, herein classed as a superstructural technique. In addition they did wrapped weaving, as it is known in basketry. What they do not seem to have done is twilling, satin, and pile weaves. The first technique is exceedingly rare among the coastal textiles of any period or locality, the second was apparently unknown in pre-historic Peru, and pile weave was never common even in Late times.

Plain Weaves.—Seventy per cent of the total Early Nazca specimens are as a whole or in part examples of simple over one and under one interlacing. This includes the four patchwork specimens, but not the tapestries which differ outwardly from other plain weaves in that the warp yarns are completely hidden by the weft. Were the tapestries to be included, the plain weaves would total 126, 77 per cent of the entire group.

Interlocking warps and wefts as found in the patchworks are a complex form of plain weaving. They evidence an unusually ambitious variant of an essentially simple weave.

Tapestry.—Only twelve specimens out of 163 are in tapestry technique, and of these few only two are characteristic. Technically, specimens 171117, 171125, and 171265 are tapestries although only three or four warps are involved in the portion giving the pieces that classification. But ribbon 170465e (Plate XXXVIIIb) is a true example, as is also tunic sleeve decoration 171217a and the center of sling 171314 (Plates XXXVIIId, XLVIIIId). These show full knowledge of the possibilities of the technique. The sleeve decoration illustrates monochrome, Kelim, eccentric, and figure-8 tapestry sub-types.

Double Cloth.—The example, fragment 170476d, has been described in full (Plate XLIIa). It was made according to a method familiar in present times.

Pattern Weaves.—These are well represented. Two varieties of single-face, and two of double-face are described both in connection with the specimens and in the Glossary. The technique is clear from the flat-view diagrams (Plates XLIII–XLVII).

The main point about the Early pattern weaves is that they illustrate, with one exception, the development of warp-float motives by warp manipulation. To this degree they somewhat resemble satins. The exception, specimen 171119, has a figure made by means of weft manipulation, which analysts consider a comparatively simple method of producing pattern comparable to weft pattern brocades. When warp patterns are woven, the whole motive must be envisaged to a degree quite unnecessary in developing weft patterns.

Wrapped Weave.—This technique is frequently found on the slings of the Late period. In the single specimen illustrating wrapped weave, the workmanship is as expertly done as if the technique were fully familiar to Early weavers (Plate XLVIIIId).

Gauze Weave.—The specimens in the collection prove the technique to have continued unchanged from Early through Late periods (Plate XLI). The gauze weave is not found in many textiles, but where it is it forms small motives which give a lacy appearance to medium weight cotton fabrics. The Cahuachi gauze motives are simple stepped frets and rectangles.

SINGLE-ELEMENT TECHNIQUES

The most numerous group within this classification consists of the plaits. All the specimens are from $\frac{1}{4}$ "– $\frac{1}{2}$ " wide with from 3 to 48 strands in their formation (Plates XLII, XLVIII). The majority are flat. Square braids, plentiful on Late period specimens, are conspicuously absent from the Early Nazca collection.

Other single-element techniques are shown in Plate LXVg, *h* (netting), and Plates LIII, LIV (twine-plaiting of the "lace" type).

SUPERSTRUCTURAL TECHNIQUES

This classification groups together fabrics in which the decorative features are additions to the basic structure. In the case of the fringes, it has seemed consistent to include two types, the unwoven warp and the extra length weft fringe, although the former is always a part of the set-up for the basic web, and the fringe on specimen 171308 which falls within the latter classification is also structural (Plate LXVIa, d).

Edge Finishes.—The assortment listed requires no new terminology except for needle-knitted cords, tabbed and fringed (Plate LXIV). Fringes, tassels, and scalloped edges are all familiar. The fringes are both short and long ($\frac{3}{4}$ "–6"), but usually short. The Early Nazca embroiderers were skilled in the three-dimensional bird-flower fringes, the "faces" of unknown use, bands veneered with needleknitting, and narrow bindings in the same technique. It seems to have been appropriate for any garment, mantle, tunic, kerchief, or apron. The finest examples are on the mantles.

STITCHERY

Seaming.—The various Early Nazca seaming stitches are simple ones in as common use today as in prehistoric times (Plate LXVII). The tunics are seamed up the sides, and narrow breadths are joined to make rectangles of the desired size. Aside from these uses, trimmings require fastening to edges. There is no example of patching, mending, or altering among the specimens in the collection.

Embroidery.—Needleknitting, to which many references have been made, is the most characteristic decorative technique found among the Early Nazca textiles (Plates LXI–LXIII). Stem stitch embroidery of the quality found in such abundance on the Paracas cloths is scarce. That on the very fragile fragments 171140a–c (Plate LVII) is finer than most Paracas work, as is also that on specimen 171033. Other embroidery is coarse (171218a, 171219a, 171220) (Plates L–LII).

By comparison with a like number of specimens from the Paracas Necropolis the Early Nazca specimens show a greater range of decorative techniques not dependent upon embroidery. The elaborate motives and solidly worked fields for motives so characteristic of the mantles of Paracas are only suggested by a few of the Cahuachi finds, those above mentioned together with 171049 and 171050 (Plate LVIIb, d). Apparently the embroidery was undeveloped, or not accorded the extreme favor it enjoyed at Paracas.

DEVICES TO VARY EFFECT

Warp-face, Plain Weave.—Except in textiles for which the warp count is very much larger than the weft count, the effect of the difference between warp and weft counts on the cloth structure is not particularly noticeable. In extreme cases, however, warp-face materials lacking selvages can be confused with tapestries. For the latter, there is one sure criterion: pattern. Tapestries are rarely woven with striped bands except to provide zone boundaries for the main motives, whereas warp-face materials are usually striped. Of the 78 warp-face materials 35 or 45 per cent come under this classification, and the proportion of warp-face plain weave fabrics among the striped specimens is even larger, 70 per cent. That the patterning furnished by colored warp yarns is varied is proved by Plates XXXVI and XXXVII.

Plaided materials are comparatively few, and of the eleven listed in the table under color changes for cross stripes, four are plaids plus pattern weave: 171218b; 171236; 171279a, b (Plates XLV–XLVII).

The single fabric with colored weft stripes only is 171305c (Plate XXXVIIj). That simple method of introducing color seems never to have been practiced to any extent by Peruvian weavers.

SINGLE ELEMENT MANIPULATION

Except for the patterns made by colored strands in the plaits, examples of single-element manipulation are few. The interlocking of embroidery yarns on the reverse side of a piece was found in only two pieces (specimens 171218a, 171219a, 171220 are parts of the same mantle), but the device was known to the Paracas embroiderers (Plate LXVIIIe). Presumably the technique would be more often found among fabrics in a larger collection.

TABLE 30
BASIC TABLE: FREQUENCIES OF PROCESSES IN THE FIELD MUSEUM COLLECTION
OF EARLY NAZCA TEXTILES

	No. prelim. rept.	No. pres. study
Number of specimens.....	117	163†
Yarns:		
Cotton only.....	40	50
*9056; 170211h, i; 170413a, b; 170462a; 170465b, c, d; 170476a, b; 170677a, b; 171055; 171071a ¹⁻² , c, e; 171110; 171118a, d, g, h; 171124d;† 171141; 171182a, b; 171183; 171213; 171214; 171217b ¹⁻² ; 171218b; 171219b; 171236; 171238a; 171267a; 171279a, b; 171289a-e;† 171305a, b; 171306; 171311; 171312; 171330		
Wool only.....	40	59
*8537; 170211c ¹⁻² , d ¹⁻⁶ , e, f, g; 170476c, d, e, f ¹⁻² ; 170665; 171033; 171109a ¹⁻² , b ¹⁻⁴ , c; 171116b; 171118b, c, e, f ¹⁻³ ; 171124a, b ¹⁻⁴ , c ¹⁻² ; 171140a, b ² ; 171180c, d; 171217a; 171225; 171227a, b; 171238b ¹⁻² ; 171258a ¹⁻² , b; 171262; 171265; 171280; 171308; 171310; 171314		
Cotton and wool.....	37	54
*9058; *9120; 170211a, b; 170462b; 170465a, e; 171045; 171049; 171050; 171054; 171059; 171071b, d; 171111; 171112; 171113; 171114; 171115; 171116a; 171117; 171119; 171125; 171140b ¹ , c; 171180a, b ¹⁻² ; 171181; 171215; 171216; 171218a; 171219a; 171220; 171221; 171222; 171223a, b; 171224; 171226; 171237; 171266a, b; 171267a; 171289f, g;† 171305c; 171309; 171321a, b ¹⁻⁵		
Warp-weft techniques		
Plain weave, number of specimens*†	95	114
1. 1 warp, 1 weft.....	91	110
*9056; *9120; 170211b, c ¹⁻² , d ¹⁻⁵ , f, g, h, i; 170413a, b; 170462a, b; 170465a, b, c, d; 170476a, b, f; 170665; 170677a, b; 171033; 171045; 171049; 171050; 171054; 171055; 171059; 171071a ¹⁻² , b, c, d; 171109b ¹⁻⁴ ; 171110; 171112; 171118a, c, d, e, f ² ; 171119; 171124a; 171140a, b ¹⁻² , c; 171141; 171180d; 171181; 171182a, b; 171183; 171213; 171214; 171215; 171216; 171217a, b ¹⁻² ; 171218a, b; 171219a, b; 171220; 171221; 171222; 171223a, b; 171224; 171225; 171226; 171227a, b; 171236; 171237; 171238a, b ¹⁻² ; 171258a ¹⁻² , b; 171262; 171265; 171266a, b; 171267a, b; 171279a, b; 171280; 171305a, b, c; 171306; 171308; 171310; 171311; 171312; 171330		
1a. 2 warps, 1 weft.....	††	...
1b. 1 warp, 2 wefts.....	...	...
1+. Interlocking warps, wefts.....	4	4
170211e; 171111; 171221; ** 171308		
Basket type.....	...	...

† The difference in the two totals is mainly due to giving individual numbers to specimens technically identical, but different in quality or color. They may be recognized by the letters and superior figures.

‡ Specimen contains maguey fiber.

*† Frequencies of subvarieties of a process may total higher than the figure given for the process, because of co-occurrences in one specimen of several subvarieties.

†† The blanks indicate the non-occurrence of techniques found in textiles of the Middle and Late periods.

** Interlocking wefts only.

TABLE 30 (continued)

Tapestry, number of specimens¶	12	12
Monochrome	4	4
171117; 171119; 171217a; 171265		
Kelim	5	5
170465e; 171217a; 171225; 171308; 171314		
Eccentric	3	3
170465e; 171217a; 171308		
Interlocking weft	1?	1
171125		
Underfloat weft		
Single warps wound	1	1
171225		
Figure 8	3	3
171045; 171180b ² ; 171217a		
Twill types		
Double cloth	1	1
2 warps, 2 wefts; variants	1	1
170476d		
2 warps, 1 weft		
Pattern weave, number of specimens	12	10
Single-face, underfloat warps	4	4
171059; 171118e; 171180c; 171226		
Single-face warp and weft floats		4
171218b; 171236; 171279a, b		
Double-face, 1 warp, 2 wefts	5	1
171119		
Double-face, 2 warps, 1 weft	3	1
170476f ¹		
Wrapped weave	1	1
Single weft	1	1
171314		
Multiple weft		
Gauze weave	3	3
170476f ¹ ; 171110; 171141		
Single-element techniques		
Half-hitching, coil without foundation	2	2
171071e; 171118g		
Netting, with knots	1	1
171118h		
Knitting	25	||
Plaiting: braids, number of specimens¶	9	15
Round	3	6
171118f ³ ; 171124b ¹⁻⁴ ; 171289a		
Flat	11	12
170211d ⁶ ; 170476d, f ¹ (2); 171109c; 171116b; 171118f ¹ (2); 171124c ¹⁻² ; 171217a; 171289a		
Square		
Plaited finish of warps, basketry type		
Twine-plaiting, "lace"	6	4
*8537; 170476c, d, e		
Weave-plaiting, cords	1	...

¶ Frequencies of subvarieties of a process may total higher than the figure given for the process, because of co-occurrences in one specimen of several subvarieties.

|| Reclassified under needleknitting embroidery.

TABLE 30 (continued)

Superstructural techniques		
Brocade, number of specimens.....	3	3
Single-face.....	...	...
Double-face (or embroidery).....	3	3
171218a; 171219a; 171220		
Edge finishes, number of specimens¶.....	16	45
Fringes		
Applied, needlemade.....	7	6
171033; 171071d; 171117; 171180d; 171265; 171309		
Applied, extra length weft to skeleton warp.....	4	5
171118b; 171217a; 171262; 171266b; 171308		
Warps left unwoven.....	6	6
170211f; 171217a; 171225; 171226; 171266b; 171308		
Tassels.....	3	2
*9120; 171314		
Needleknitted cords, tabbed and fringed.....		4
171033; ‡‡ 171125; 171262; 171265		
Needleknitting, 3-dimensional edge trims, etc.....	11	11
*9058; 170211a; 171112; 171113; 171114; 171180a, b ¹⁻² ; 171215; 171223a, b;		
171224; 171237		
Tabs.....	5	7
Woven.....	5	2
171140b ¹⁻²		
Needlemade.....		6
170211b; 171071b; 171116a; 171140c; 171180d; 171309		
Scallops: needlemade; woven.....		3
171045; 171109a ¹⁻²		
Stitchery		
Seaming, number of specimens¶.....		27
Whipping; zigzag; "sham" hem stitch.....	26	22
170211f; 170462b; 170476f ¹ ; 170677a, b; 171033; 171059; 171125; 171140c;		
171214; 171217a; 171224; 171226; 171237; 171262; 171265; 171266a, b;		
171280; 171305a; 171308; 171330		
Saddler's, lacing.....	2	5
171119; 171217a; 171262; 171308; 171310		
Running.....	4	2
170465c; 171306		
Hemming.....		2
171215; 171266b		
Wrapping of core.....	...	...
"Warps" added to edge.....	2	2
171033; 171045		
Embroidery, number of specimens¶.....	25	48
Blanket stitch.....		1
171266b		
Stem, outline.....	12	15
170465a; 171033; 171045; 171049; 171050; 171054; 171140a, b ¹⁻² , c; 171180d;		
171218a; 171219a; 171220; 171266b		
Needleknitting.....	3	36
*9058; 170211a, b; 170476f ² ; 171033; 171071b, d; 171112; 171113; 171114;		
171115; 171116a; 171117; 171125; 171140b ¹⁻² , c; 171180a, b ¹⁻² ; 171181; 171215;		
171223a, b; 171224; 171237; 171262; 171265; 171267b; 171309; 171321a, b ¹⁻⁵		
Couching.....		...
Chain.....	3	...

¶ Frequencies of subvarieties of a process may total higher than the figure given for the process, because of co-occurrences in one specimen of several subvarieties.

‡‡ Similar to others in the group in effect; center an embroidered band.

TABLE 30 (continued)

Figure 8.....		
Seaming stitches for embroidery.....	7	4
Double running.....		3
*9120; 170465a; 171216		
Tent hemming.....		1
171222		
Twined stitches.....		1
171266a		
Devices to vary effect		
Yarn spinning		
Slack twist.....		
Crêpe twist.....	9	10
170413a; 170476a, b; 170677a, b; 171182a; 171237; 171262; 171265; 171305c		
Two tone.....		2
170211c ¹⁻²		
Structural, set-up of loom		
Warp face, plain weave.....	25	78
*9056; *9120; 170211b, d ¹⁻⁵ , f, g; 170413a, b; 170462a, b; 170465a, b, c, d; 170476a, b; 170665; 170677a, b; 171033; 171049; 171050; 171055; 171059; 171071a ² , b, d; 171109b ¹⁻⁴ ; 171110; 171112; 171118a, c, e, f ² ; 171124a; 171140b ² , c; 171180d; 171183; 171213; 171215; 171217a, b ² ; 171218a; 171219b; 171220; 171222; 171223a, b; 171225; 171227a, b; 171236; 171237; 171238b ¹⁻² ; 171258a ¹⁻² , b; 171262; 171266a, b; 171267a; 171279b; 171280; 171305a, b; 171306; 171308; 171310; 171311		
Drawing in for stripes, patterns.....	34	49
170211c ¹⁻² , d ¹⁻⁵ , e; 170462b; 170465b, d; 170476d, f ¹ ; 170665; 171033; 171059; 171071a ¹ ; 171109b ¹⁻⁴ ; 171111; 171118e, f ² ; 171124a; 171140b ² ; 171180c; 171183; 171218b; 171224; 171225; 171226; 171227a, b; 171236; 171238b ¹⁻² ; 171258a ¹⁻² , b; 171262; 171265; 171279a, b; 171280; 171305b; 171308; 171310; 171311		
Scaffolding weft for interlocking plain weave.....	2	3
170211e; 171111; 171308		
Scaffolding weft for shaping web.....		
Warp locking, end-to-end.....	3	3
170211e; 171111; 171308		
Tab formation.....*	5	2
171140b ¹⁻²		
Loom joining of widths.....	2	2?
171224(?); 171262(?)		
Spaced warps.....	3	2
171224; 171225		
Tubular construction.....	1	1
171180c		
Warp element manipulation		
Crossing against slip.....		1
171119		
Grouping for tapestry.....		3
171119; 171217a; 171308		
Weft element manipulation		
Color changes for cross stripes.....	8	11
170211c ¹⁻² , e; 171071a ¹ ; 171111; 171218b; 171236; 171279a, b; 171305c; 171311		
Weft grouping, for size.....	1	1
171314		
Weft lock, as in tapestry.....	2	2
170476d; 171221		
Warp lock, as in tapestry.....		

TABLE 30 (continued)

Warp-weft lock, as in tapestry.....	1	1
171125		
Counterpairing of wefts.....		2
170211f; 171217a		
"Facing" one color with another.....		...
Double set of weft, plain weave.....	3	2
171118f ² ; 171124a		
Weaving techniques		
Loose beating up.....	5	6
*9056; 170211c ¹⁻² , h; 170476a, b		
Weft-to-warp change.....	1	1
171225		
Padding yarns introduced.....		...
Kelim slot for neck opening.....	2	3
171071b, d; 171266b		
Single element manipulation		
Three-dimensional knitting.....	11	||
Counterpairing in embroidery, twining.....	1	3
170476c, e; 171054		
Interlocking of embroidery yarns.....		4
170465a; 171218a; 171219a; 171220		
Plaiting element manipulation		
Color variations in braids.....		11
170476d, f ¹ ; 171116b; 171118f ³ ; 171124b ¹⁻⁴ ; 171217a; 171289f, g		
Surface decoration		
Painting.....	1	1
*9056		
Tie-dyeing.....		...
Feathers, applied.....	1	2
171071c; 171266b		

|| Reclassified under needleknitting embroidery.

CONCLUSIONS

We may conclude from the 163 specimens in the Early Nazca collection that the weavers of the period not only had and knew how to handle fine cotton and wool yarns, dyes, weaving, and stitchery techniques, but that they were familiar with the variety of possibilities offered by combinations. Although the examples are few in number, there are garments illustrating from one to fourteen techniques. Most of them are basic, yet many are adaptations to designs or uses. Very little of the workmanship is slovenly, and none of it gives the impression of being experimental. Even by today's standards of fineness and uniformity, yarns, weaves, and embroidery meet the test.

Table 30 weights a simple whipped seam equally with a complicated edge finish: each counts one. On that basis, many specimens are entered once, twice, or more times in the table. The fragmentary condition of a good part of the collection has been mentioned. This condition is undoubtedly responsible for the numbers of specimens falling in the groups of the fewest techniques, but it is not responsible for the great preponderance of plain weaves. As in all other Peruvian periods, the plain weave with its obvious color variations was a fundamental technique. Under single technique classification, plain weave is not first in frequency, because, in all likelihood, a rectangle with no decorative features was rare, and the fragments lack edges or corners showing the combinations made in the original garment.

Table 31 summarizes by numbers and percentages the material given in Table 30.

TABLE 31
RANGE OF TECHNOLOGICAL PROCESSES FOUND IN THE EARLY NAZCA SPECIMENS

Number of techniques represented in each specimen	Number of specimens	Per cent of collection	Number of techniques represented by all specimens in group	Number of specimens
1	33	20	9: needleknitting plain weave plaiting various (6)	14 5 5 9
2	31	19	17: plain weave+1 other technique plaiting+color variation various combinations of 2 techniques	20 5 6
3	47	29	22: plain weave+warp face+stripes plain weave+warp face+stitchery various combinations of 3 techniques	21 9 17
4	18	11	23: plain weave+warp face+2 techniques various combinations of 4 techniques	15 3
5	20	12	27: plain weave+4 other techniques various combinations of 5 techniques	17 3
6	5 171119 171140b ¹⁻² 171140c 171224	3	15: plain weave+5 other techniques	5
7	2 170476d 170476f ¹	1	11: double cloth+6 other techniques plain weave+6 other techniques	2
8	2 171225 171265	1	14: plain weave+7 other techniques	2
9	1 171033	0.6	9: plain weave+8 other techniques	1
10	2 171262 171266b	1	15: plain weave+9 other techniques	2
13	1 171308	0.6	13	1
14	1 171217a	0.6	14	1
Totals	163			163

GLOSSARY OF TERMS WITH DIRECT APPLICATION TO THE EARLY NAZCA COLLECTION

Apron: a rectangular web with strings or ties from the corners (Plate XXXIVa).

Batten (also called sword): the shaped piece of wood by means of which the shed is kept open for the weft yarn, and each inserted weft is driven down to the partially woven web. The word is both noun and verb.

Blanket stitch (also called coil without foundation, half-hitching, and buttonhole stitch): an embroidery stitch used for protecting or reinforcing edges (Plate LXa). Used in Early Nazca textiles for foundations under needleknitting veneer, and for tabs (Plates LXIIIg, LXVa).

Brocade: a form of superstructural patterning in which supplementary yarns develop design motives by means of floats. The extra yarns usually alternate with the basic yarns of the fabric. In double-face brocading the pattern floats are as important for the reverse side as for the surface side. Brocaded materials are often indistinguishable from embroideries (Plates L-LII).

Buttonhole stitch: see *Blanket stitch*.

Count: the number of warp and weft yarns per unit of measurement, the inch. For closely woven materials, count indicates the quality of the fabric.

Counterpairing: in twining or weaving, the turning of the two elements of adjacent pairs toward or away from each other, thereby forming a plaited effect (Plates LIIIa, LXb); in stem stitch embroidery, the throwing of the thread first above and then below the needle on alternate stitches (Plate LXf).

Crepe twist: an extra amount of twist given in yarn spinning, which results in a pebbly surface of the woven fabric upon release from the loom.

Crossing against slip: the exchanging of the regular positions of the warp yarns with neighboring warps to insure keeping in place the last wefts put across the web; usually done between plain weaving and a tapestry border (Plate LXVIIIc).

Double cloth: a reversible fabric requiring two sets of warps arranged one above the other, each with its own weft. Ordinarily, the sets are of different colors. To make the pattern, certain reverse-side warps are raised to replace surface-side warps which are lowered. Colors are exchanged, and ties are formed between otherwise separate portions of the fabric. Since each set of warps, no matter what its position, is crossed only by its own weft of the same color, strongly contrasted design areas are produced (Plate XLIIa).

Double running stitch (also called punto scrito): an embroidery stitch in which the material passed over by the needle on the first line of running stitches is covered by a second line (Plate LXc, h, i).

Double set of wefts: two wefts enter the shed from opposite sides, and cross each other in the shed (Plate XLa).

Drawing in for stripes, patterns: setting up the loom with colored warp yarns (Plates XXXVI, XXXVII).

Finger knot: the simplest knot which may be tied with a single element; it gets its name from the method of turning the element around the left forefinger in order to make a loop (Plate LXVh).

Float: a warp or weft yarn free for a distance upon the surface of the fabric. Patterns are built up by means of floats.

Fringes: extra lengths of wefts. Most fringes have plain-weave tape-like headings from 2-5 warps wide. The fringe proper is the extra length of weft which turns about a skeleton warp set the desired distance from the other warps. Upon completion of the weaving, the skeleton warp is withdrawn, leaving tightly twisted weft loops. A similar fringe is made by the extension of the regular weft to a scaffold yarn (Plate LXVIId).

Needlemade. The Nazca and Paracas types are similar: loops made by drawing an extra yarn through whipping stitches on the edge of the garment are twisted tightly into a fringe (Plate LXVIc).

Unwoven warp lengths. See Plate LXVIa.

Gauze weave: manipulation of certain warps by drawing 1 and 3 over 2 and 4, and securing the cross with a passage of the regular weft to produce the effect of openwork. The Peruvian gauze is used in combination with plain weave (Plate XLIIa-c).

Half-hitching: see *Blanket stitch*. Plate LXVg shows use in netting.

Heddle: a device for separating the warps into what are called sheds for the insertion of weft. The primitive heddle, also called heald, is a rod from which string loops depend to encircle alternate warps. When the rod is drawn up, the odd or even warps are separated from the other half of the set-up.

Hemming stitch: a seaming stitch used for fastening down edges (Plate LXVIIh).

Interlocking: embroidery yarns. A method by which yarns of two colors, instead of building up their respective motives independent of each other, loop about each other at the common boundary line (Plate LXVIIIe).

Warps and wefts. Multicolored patchwork constructed by means of skeleton warps and wefts around which the set-up yarns turn. The weaving is so accomplished that the scaffolding yarns are unnecessary upon completion of the fabric, since both basic sets interlock (Plates XXXIXa, c, LXVIIg).

Warp-weft type. A technique normally found in tapestry. Two wefts interlock with each other, at the same time enclosing a warp (Plate LXIVe).

Weft yarns. A method by which color change is effected at the boundary of a design motive; normally found in tapestry (Plate XXXIXb).

Kelim slot: an opening of the desired length left between two adjacent warps by turning around them the weft yarns which come from opposite sides of the web (Plate LXVIIIg).

Lacing stitch: see *Saddler's stitch*.

Loomjoin: done with an extra length of yarn independent of the weaving elements, which draws together a breadth of cloth already woven and a breadth on the loom by engaging corresponding weft turns on the adjacent edges (Plate LXVIIIf).

Loom strings: the first two, three, or more heavy wefts put across the warp yarns (Plate LXVIa).

Mantle: the largest rectangular garment found among the Early Nazca pieces; usually formed by joining two breadths of material. Patterned in the loom, embroidered, and edge-trimmed (Plate XXXIVb).

Needleknitting: a name given to the modern plaited cross stitch which is known to embroiderers in various parts of the world as Ceylon stitch, Portuguese stitch, etc. The Peruvian variety is identical to the modern stitch in method of making (Plates LXI-LXIII).

Needleknitted cords, tabbed and fringed: cords with tiny buttonhole stitch tabs on one side, fringes on the other (Plate LXIV).

Needleknitting, three-dimensional: flower and bird forms developed in the needleknitting technique over woven or blanket-stitch foundations (Plates LXI-LXIII).

Pattern weave: double-face, 1 warp, 2 wefts: design motives made by weft floats independent of the warp set-up. In these motives the bobbin carrying the decorative weft floats over and under groups of warps. The weave resembles brocading except for the fact that there are no alternating basic weft yarns in the pattern (Plate XLIIIb).

Double-face, 2 warps, 1 weft: design developed by warp floats, a method of patterning dependent upon the colors set up for warps (Plate XLIb).

Single-face, underfloat warps: a fabric with design developed by the appearance of certain warps on the surface of the web; when these warps are not necessary to the pattern, they float on the reverse side (Plates XLd, e, XLIIIa, c-e, XLIVb).

Single-face, warp and weft floats: a fabric with design dependent upon arrangement of colors in the set-up, and in their subsequent shedding. The latter accounts for the warp floats, and the weft floats are made by carrying the bobbin yarn over and under groups of warps (Plates XLIVa, XLVIa-f, XLVII).

Pick: one length of weft from side to side of a design motive (in tapestry), or of a breadth of fabric in the loom. The term is used both as a noun and as a verb meaning to insert the weft in the shed.

Plain weave: the interlacing of a single weft yarn over and under single warps.

Plaiting: synonymous with braiding.

Running stitch: the simplest of all seaming and embroidery stitches; identical to darning. Rarely found on Peruvian garments of any period (Plate LXVIIi).

Saddler's stitch: a seaming stitch which laces the edges of two webs together without overlapping (Plate LXVIIc).

Scaffolding yarns: warp or weft yarns forming temporary foundation elements for multicolored patchwork fabrics, end-to-end warp locking, and separately woven fringes and tabs (Plates XXXIXa, c, LXIVa, c-e, LXVb, LXVIa, d).

Scallops: needlemade: an edge finish formed by weaving over and under with the needle between the selvage and a loop of yarn made as required (Plate LXVe, f).

Woven: a unique form resulting from weaving narrow bands on two warps, the number of wefts indeterminate. In the Nazca example the wefts are carried over and under the two warps in the following order: 1-2-3-4-5-6*6-5-4-3-2-1 (Plate XLc, f).

Set-up: see *Warps*.

"Sham" hem stitch: a seaming stitch (Plate LXVIIId).

Shed: the triangular space produced by raising alternate warps (in plain weaving), or groups of warps (in pattern weaving), by means of a heddle device. The weft is carried through this space from side to side of the web.

Skeleton yarns: see *Scaffolding yarns*.

Sling: various types both simple and elaborate are found in sites from the different Peruvian periods. Technologically, slings are alike in having slotted or net-like center portions, long plaited or wrapped-weave cords from each end, finger loops and tassels as finials for the cords (Plate XLVIII).

Square count: an equal number of warps and wefts per unit of measurement, the inch.

Stem stitch (also called crewel and outline stitch): a simple line embroidery stitch made similar to back stitch in seaming, wrapped weave in basketry, and Soumak stitch in rug work. Usually the work proceeds from left to right by entering the needle between the 4th and 5th yarns on the surface side, and bringing it up from the reverse side between the 2nd and 3rd yarns (Plate LXd-g). The quality of work, whether fine or coarse, is dependent upon the warp-weft count of the fabric. Most of the Peruvian stem stitch embroidery appears as solid filling for pattern motives.

Stock-dyed fibers: raw stock, usually wool, dyed before spinning it into yarn.

Superstructural techniques: those not functional to the making of the basic web. In brocade and embroidery the decorative yarns do not constitute an essential part of the structure.

Tabs: needlemade: blanket or buttonhole stitches worked row on row (Plate LXVa).

Woven: Plate LXVb suggests two types dependent upon scaffolding yarns. One type is made by an extension of the regular wefts which become warps; a second type is made by weaving upon warp loops leaving Kelim slots between adjacent tabs.

Tapestry: eccentric: a type in which warps and wefts interlace at angles other than right angles. Generally used to develop irregularly shaped design motives.

Figure-8: a type in which the weft interlaces as in plain weave with two single warps or two groups of warps (Plate LXIVa).

Kelim: a type distinguished by slots at the sides of pattern areas. The wefts of one color turn on an edge warp; those of the adjoining color turn on the adjacent warp. The length of the slot is governed by the size of the color area (Plates XXXVIIIa, d, LXVIIIId).

Monochrome: a plain weave in which wefts of one color are battened together so closely as to completely cover the warps.

Single warps wound: a method by which a very narrow line of color is produced. A single warp or a single warp group is wrapped closely with weft yarn (Plates XXXVIIIa, LXVIIIId).

Tent stitch: a slanting stitch used by the embroiderer to veneer single yarns of the basic material by winding variously colored threads about them (Plate LIXb).

Tunic: a sleeveless shirt formed of one or two breadths of material. An opening for the head is

left in the center seam, or provided for by a Kelim slot. The side edges are seamed to allow for medium size armscyres (Plate XXXIVc-e).

Turban bands: very narrow colored ribbons in weaving or plaiting techniques (Plate XL).

Twine-plaiting: "lace" constructed of pairs of yarns which twine about each other for distances dependent upon the design. Where two pairs meet to cross, each separates and plaits as in modern bobbin lace (Plates LIII, LIV).

Twined stitches: made with two weft yarns, or with yarns in needles as in true embroidery. The introduced strands twist a half turn about each other, enclosing groups of warps between each two intersections. This is the simplest two-strand twine (Plates LXb, LXVIIIa).

Warp: the yarns stretched on the loom preparatory to weaving. The completed warp series is called the set-up.

Warp face: the appearance given to a fabric by a preponderance of warp yarns over the number of weft yarns per inch. Most of the striped materials in the Early Nazca collection are warp face.

Warps added to edge: devices by which elements were provided for weaving very small edge details (Plates LXIVc, LXVe).

Warp element manipulation: management of the warp yarns so as to form patterns by means of warp floats (Plates XLIII-XLVII).

Web: a textile fabric, especially one under construction on the loom.

Weft (also called woof, filling, pick): the yarn carried by a bobbin or shuttle from one side to the other across the warps in weaving.

Weft element manipulation: management of the weft yarns so as to form patterns by means of floats, as in darning. The majority of brocaded fabrics are examples of weft manipulation (Plates L-LII).

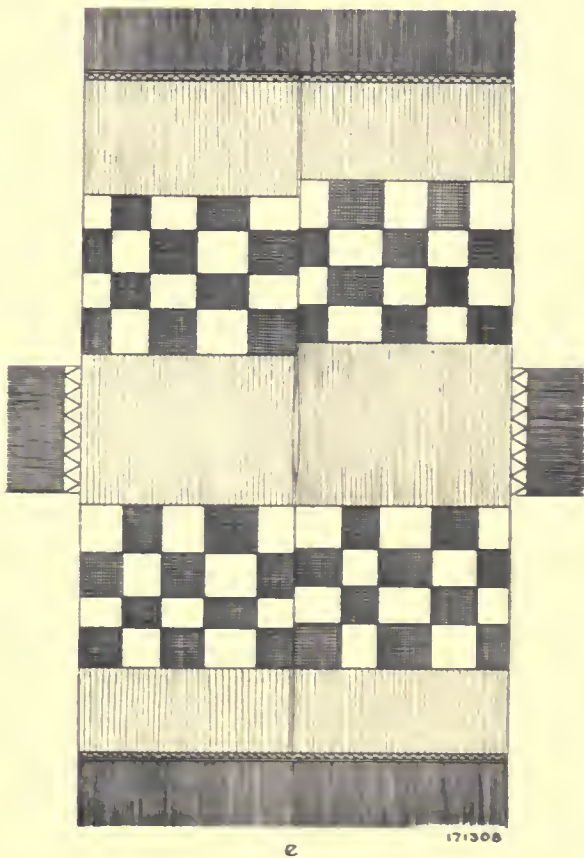
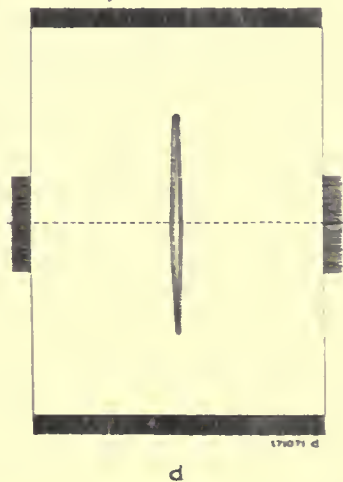
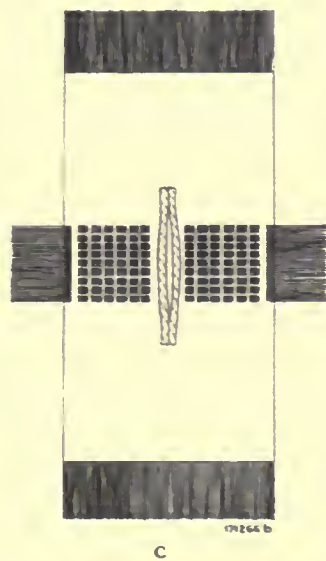
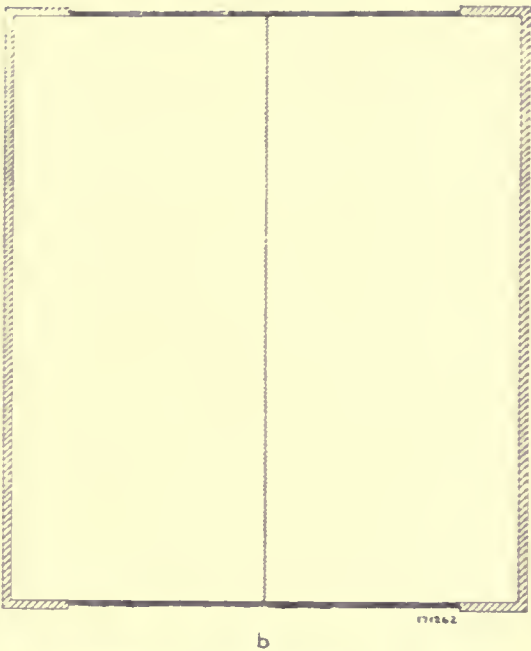
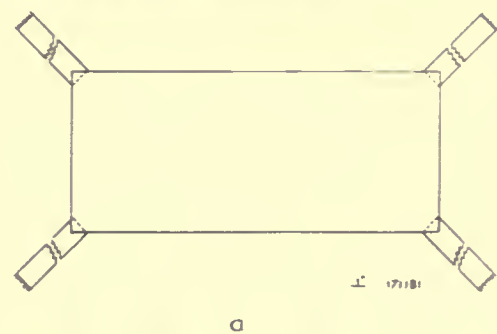
Weft face: the appearance given to a fabric by a preponderance of weft yarns over the number of warp yarns per inch. Tapestry is the most extreme example of a weft-face fabric.

Weft-to-warp change: presupposes a space in the warp set-up across which the regular weft was carried. Upon completion of the weaving, these bare wefts were woven upon (probably with needles as in other fine tapestry work) as if they were warps (Plates XXXVIIIa, LXVIIId).

Whipping stitch: a very shallow wrapping stitch taken at right angles to two fabric edges. A whipped seam opens out flat. The stitch was most frequently used by the ancient weavers to fasten together separately woven or constructed parts of garments. In several specimens (possibly loom-joined) it is found taken between the first and second edge warps and through each of the corresponding weft turns on the two breadths. Probably, in those instances, the stitch drew the two edges together as in lacing (Plate LXVIIj).

Wrapped weave (also called Soumak stitch): formed by carrying the weft element forward and once around a single warp at a time. Similar to stem stitchery which is done on fabric, in contrast to wrapping on bare warps (Plate XLVIIIId, detail).

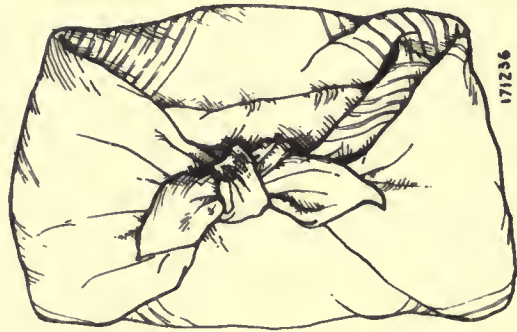
Zigzag stitch: a decorative seaming stitch with the advantage of strength. Plate LXVIIIb shows the method of making: the needle is brought out at A, is inserted at B, is brought out a second time at A; the needle is then inserted at C, is brought out at D, is again inserted at C, is brought out a second time at D, and repeat.



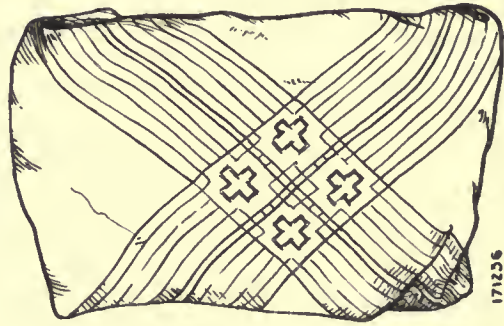
EARLY NAZCA PERIOD GARMENTS



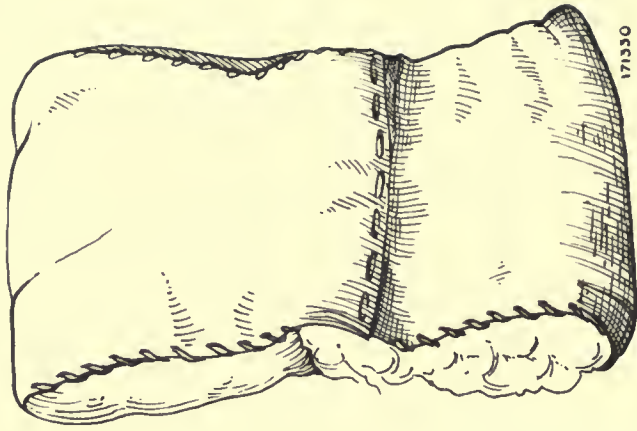
a



b

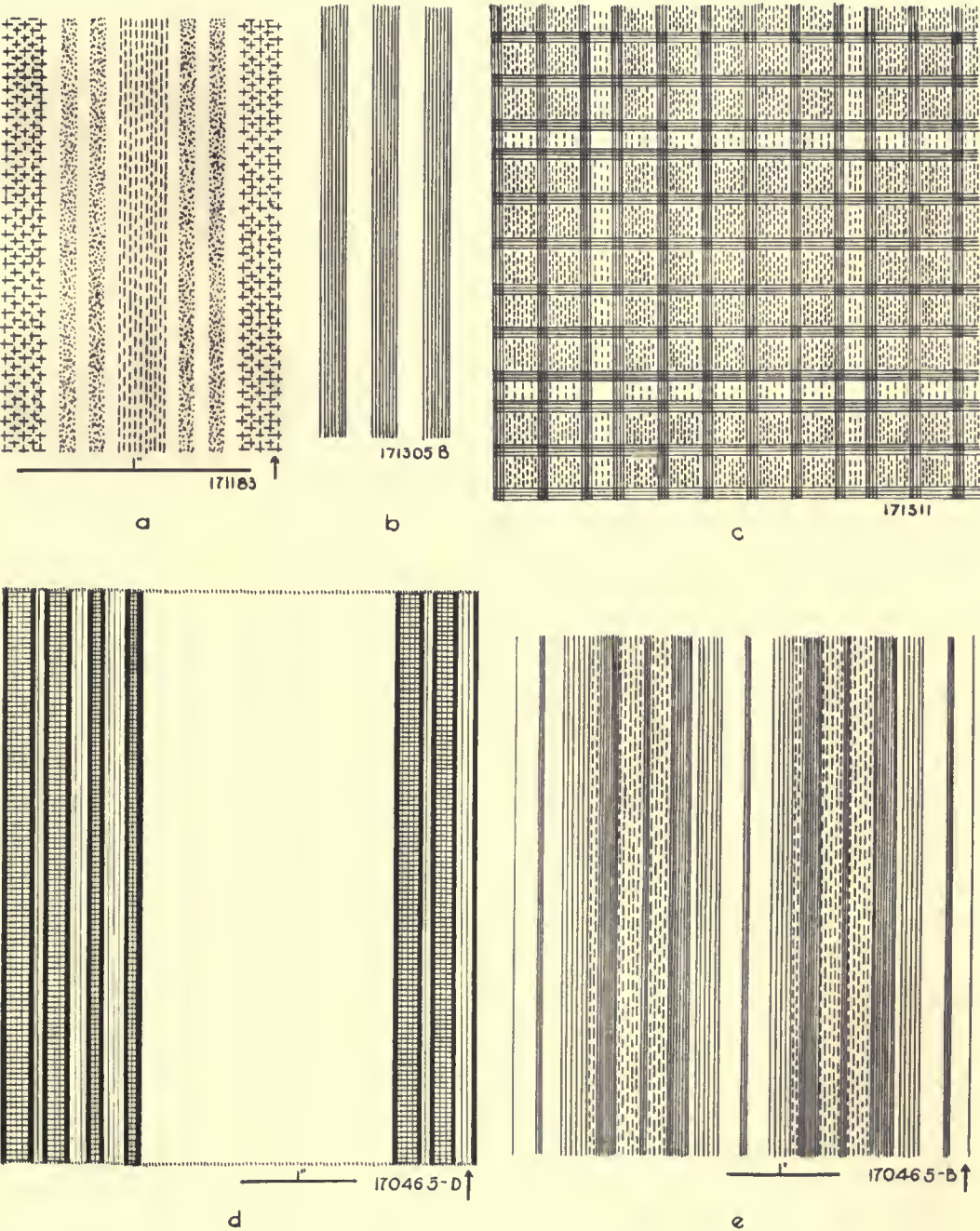


c

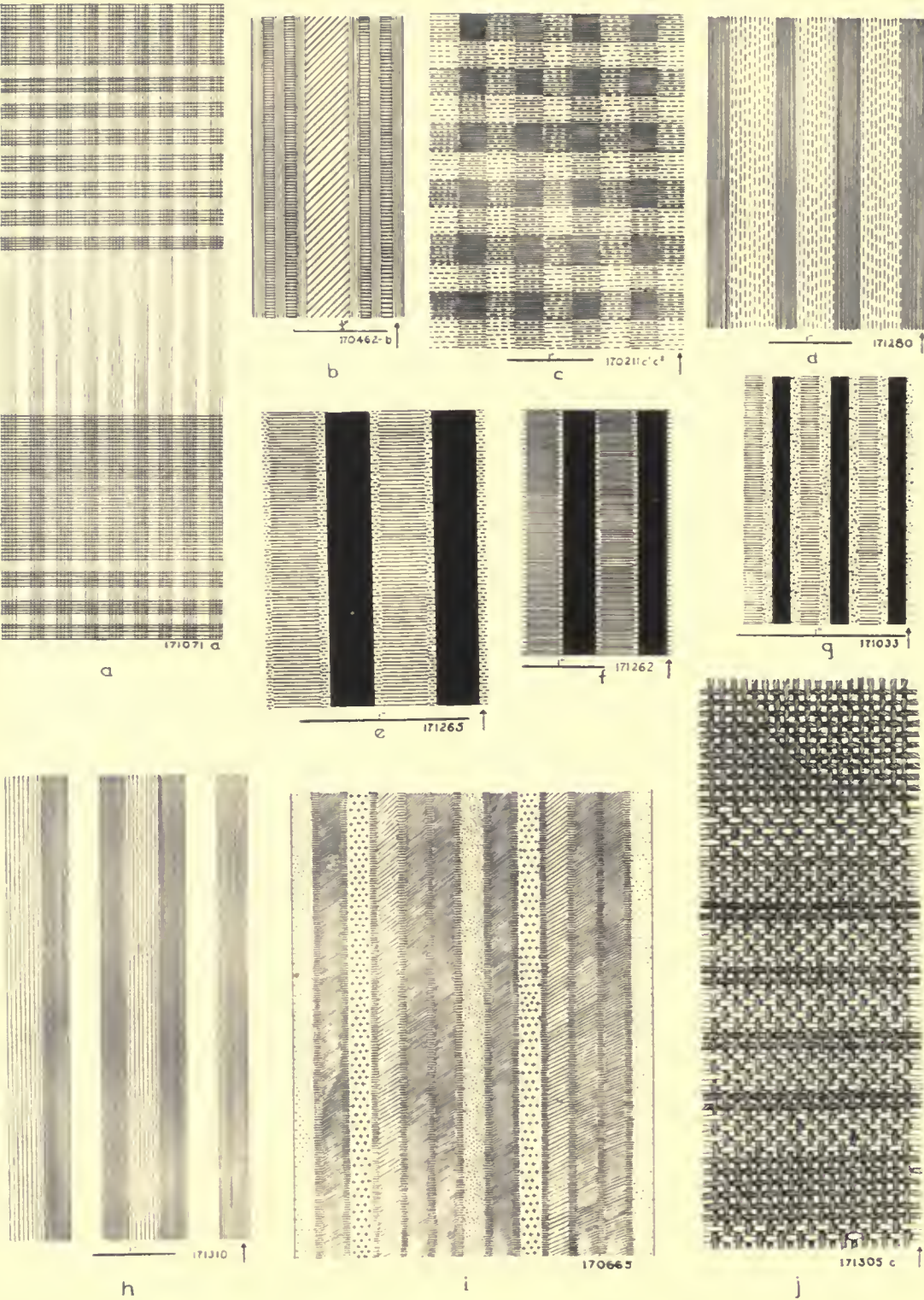


d

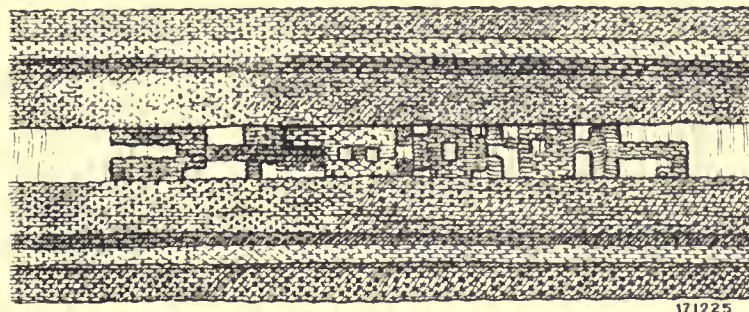
PADS AND A HEADBAND(?)



STRIPED COTTON MATERIALS



STRIPED WOOL MATERIALS

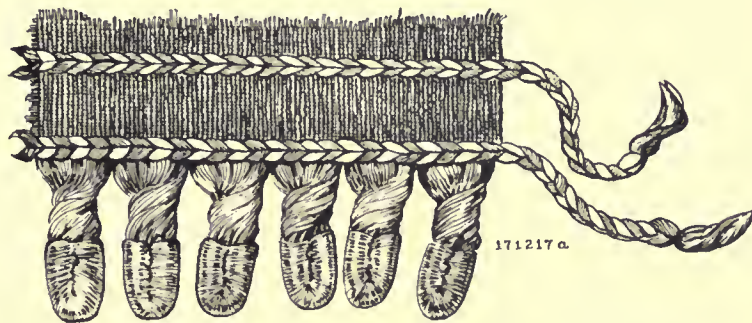


171225

a

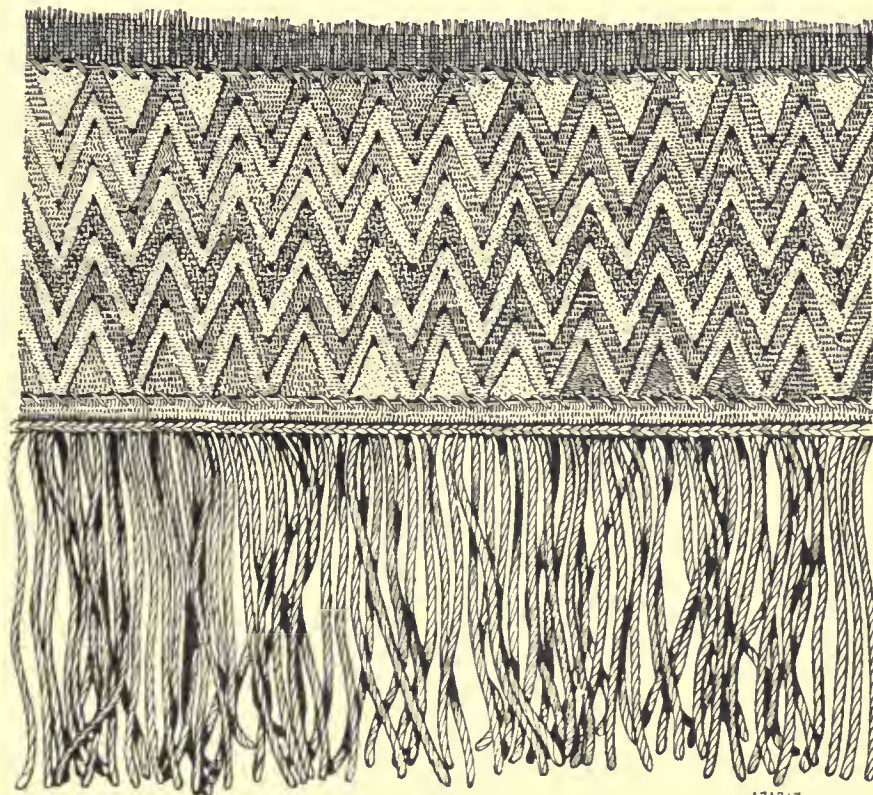


b



171217 a

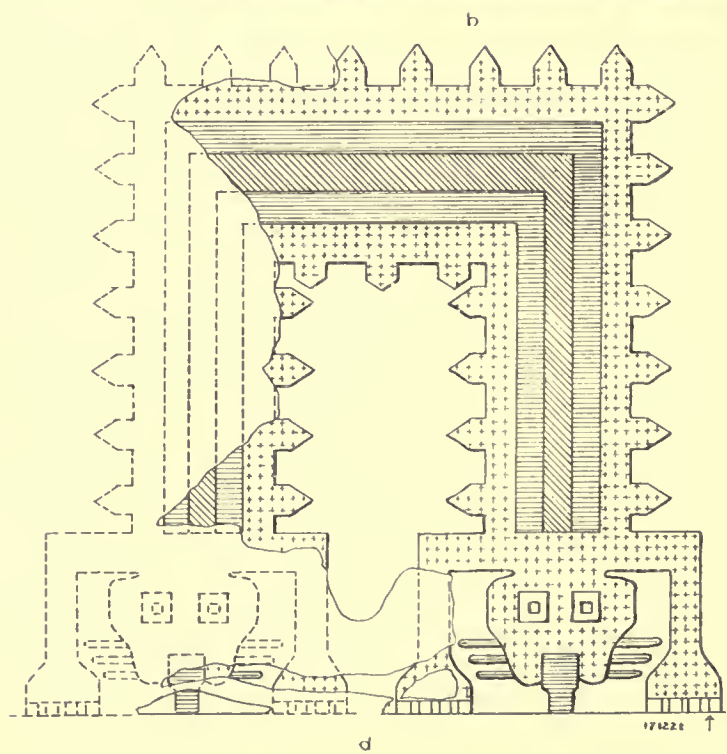
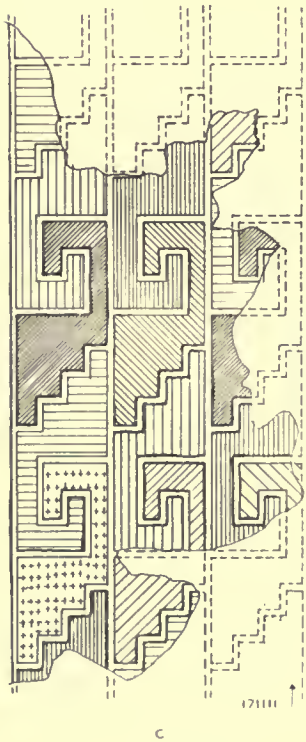
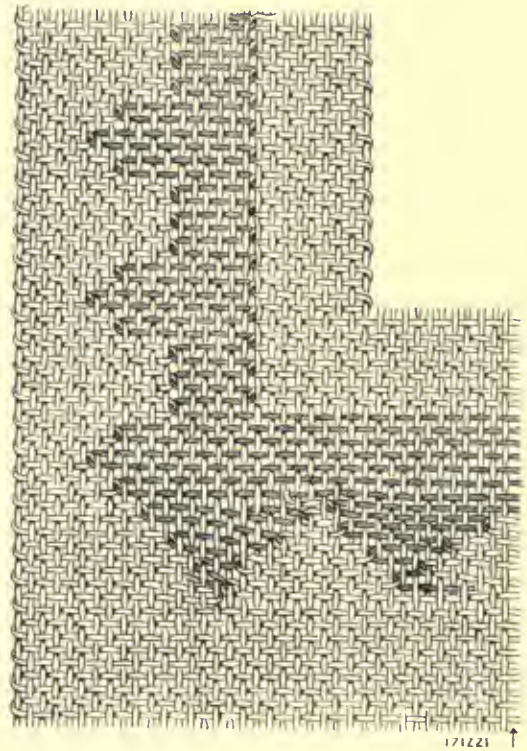
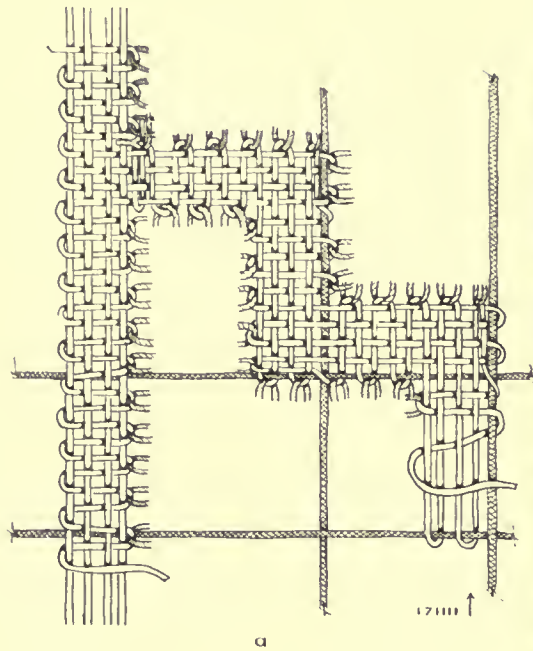
c



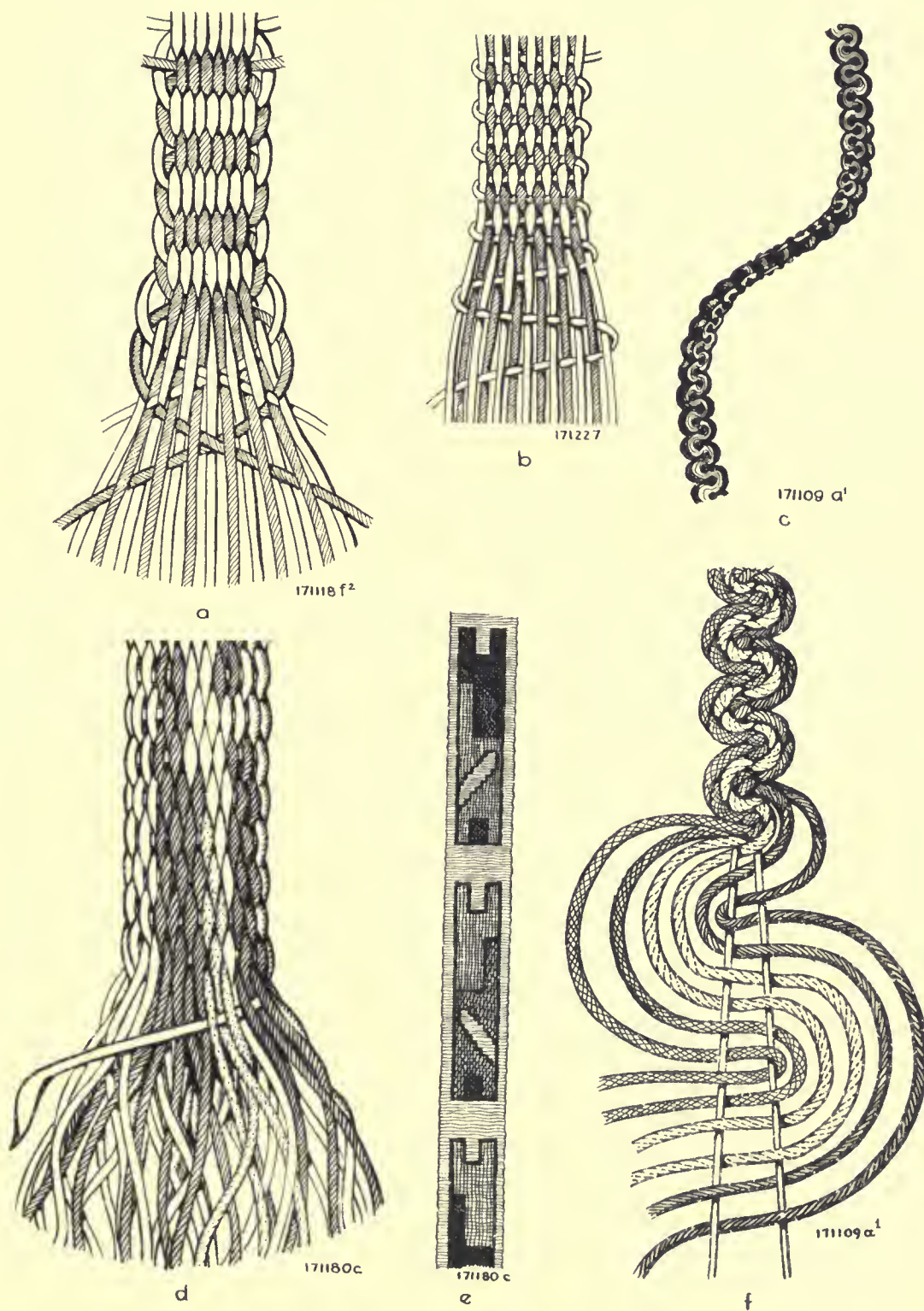
171217 a

d

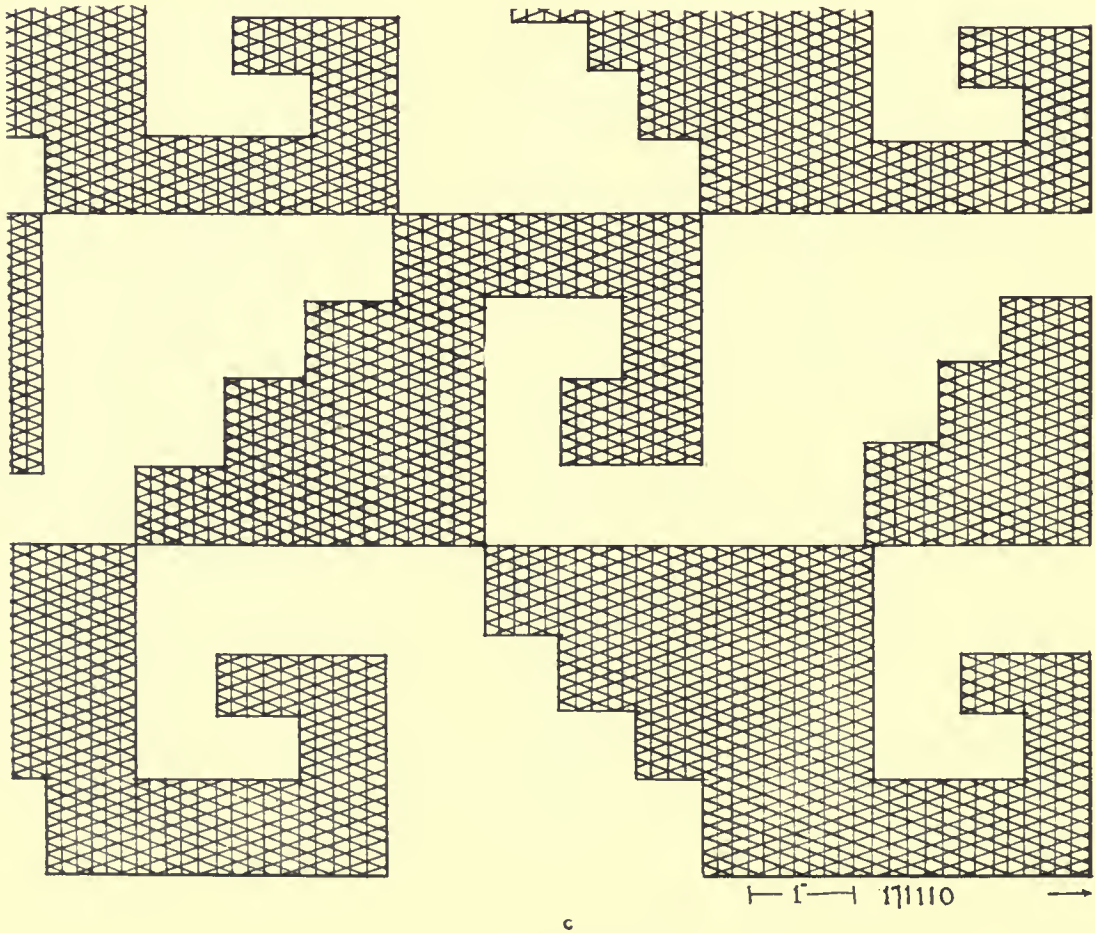
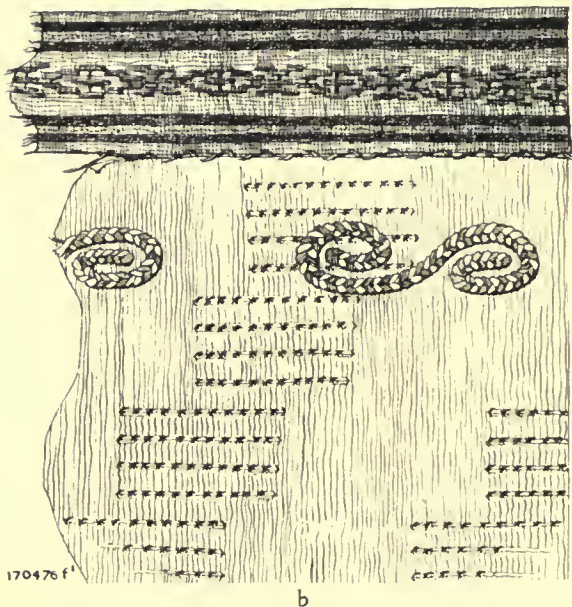
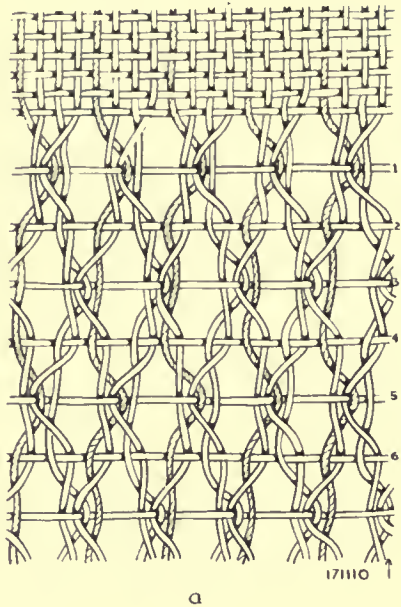
VARIATIONS IN TAPESTRY TECHNIQUE



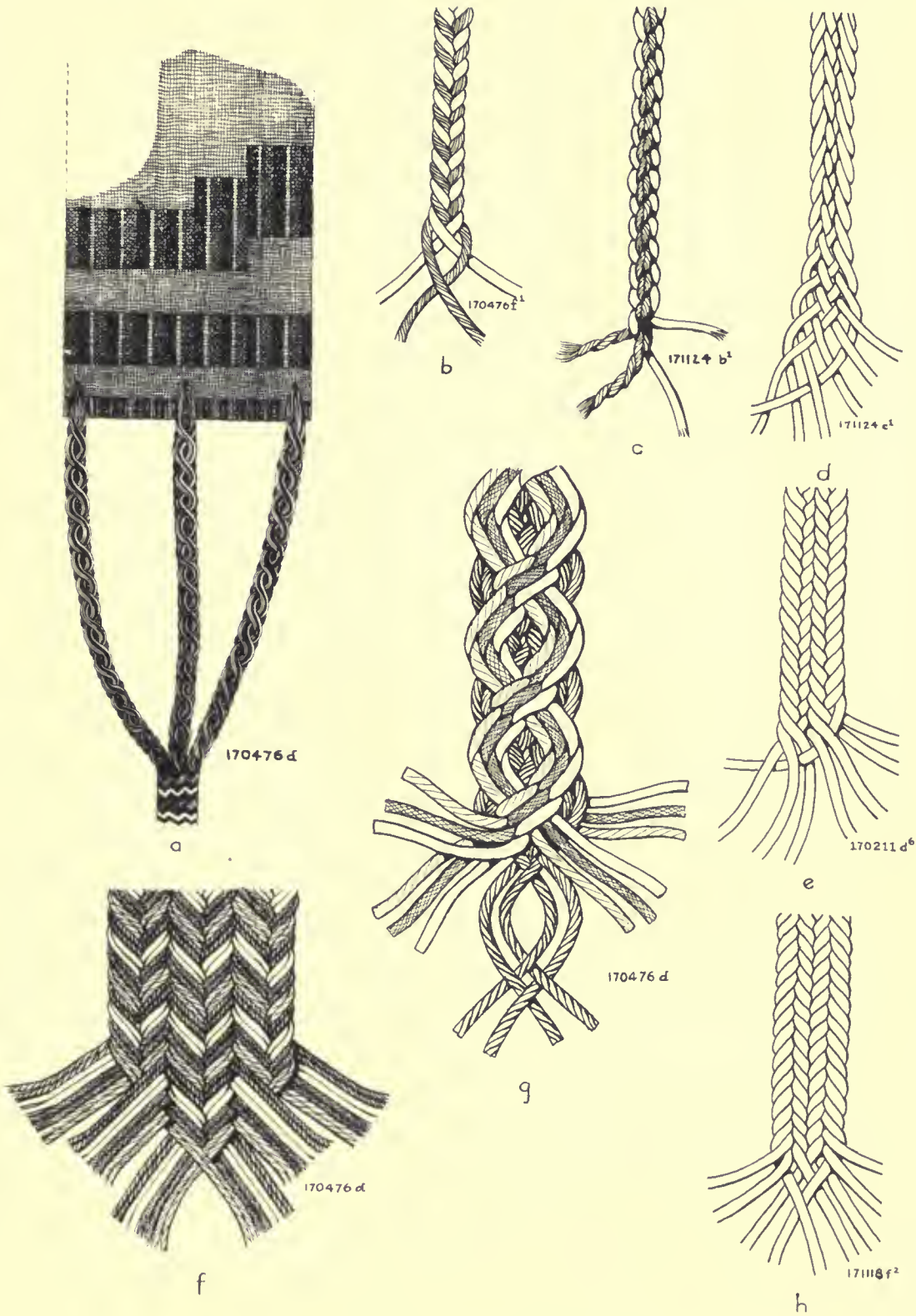
INTERLOCKING IN PLAIN WEAVES



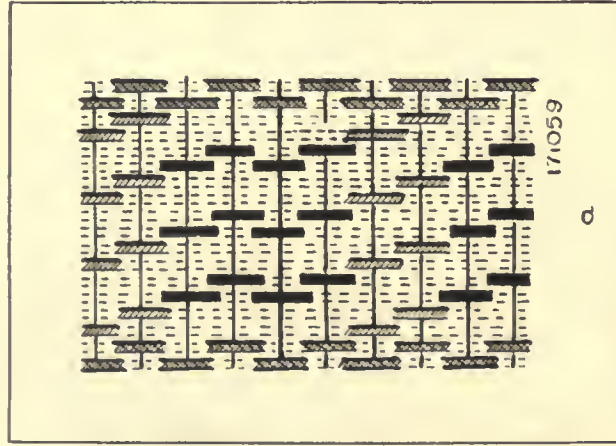
WOVEN BANDS AND CORDS



GAUZE WEAVES



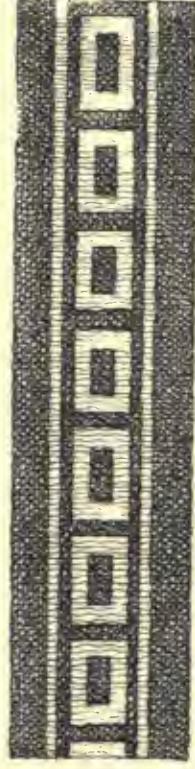
PLAITED BANDS AND CORDS



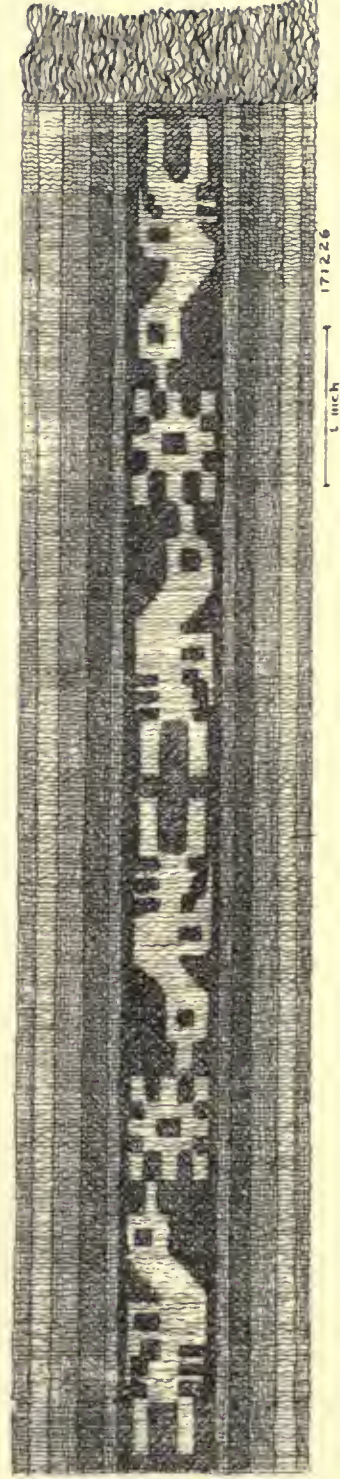
b



c

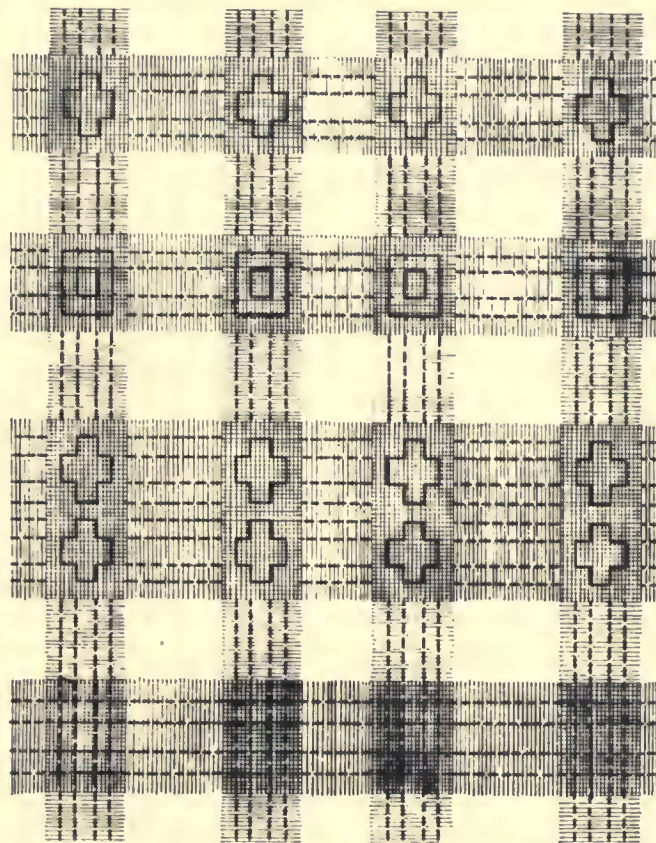


d



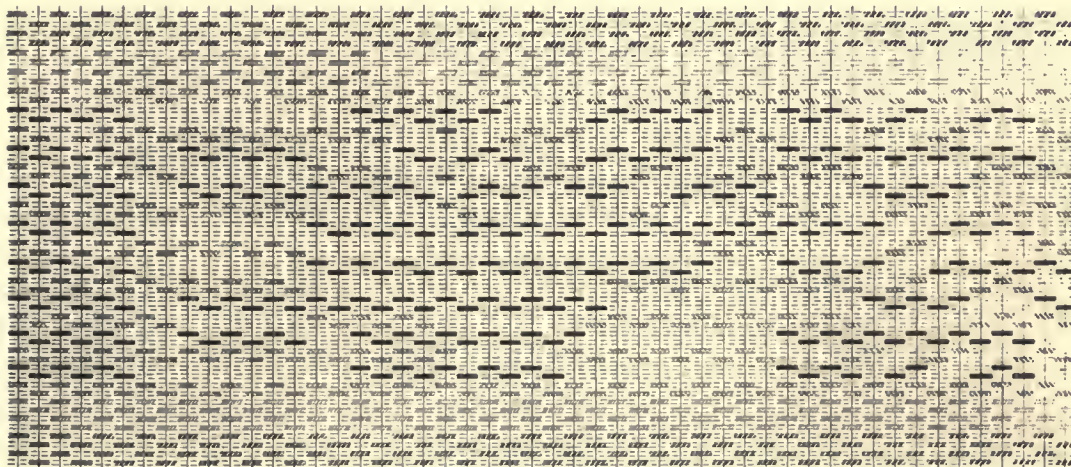
e

PATTERN-WEAVE BORDERS



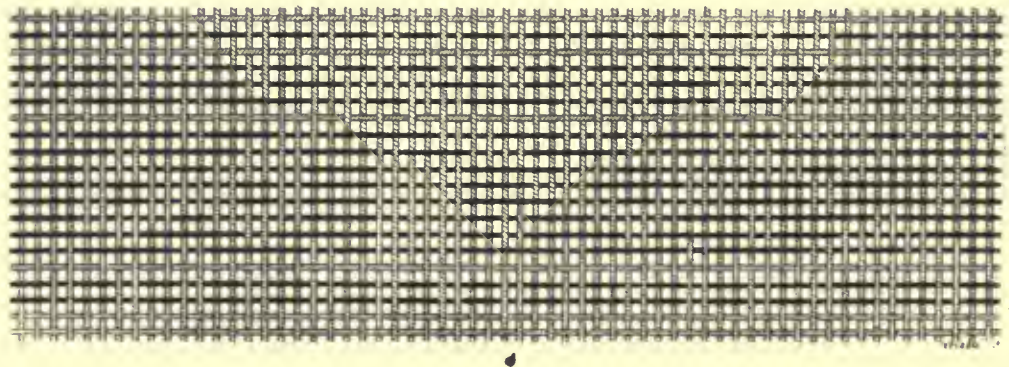
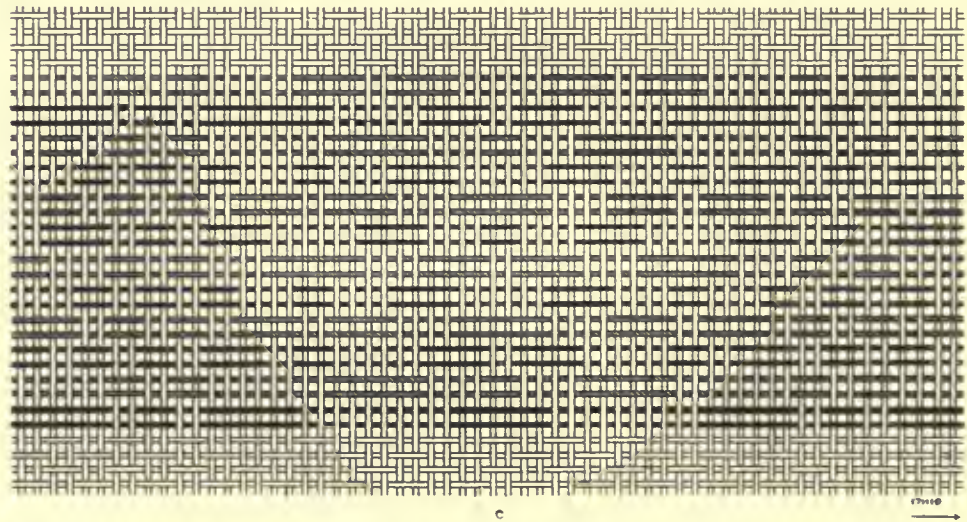
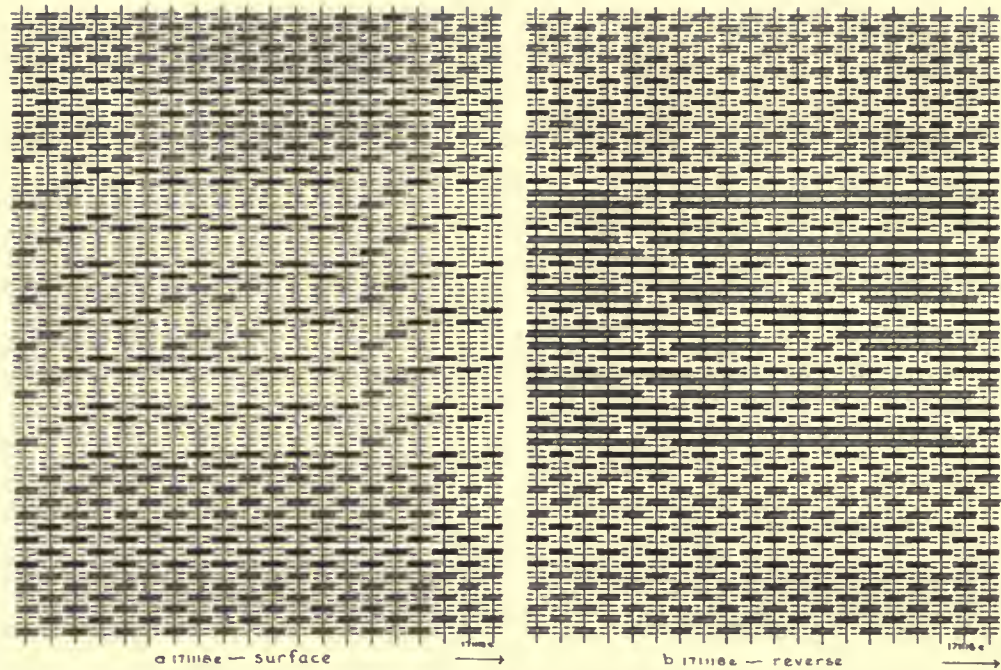
171279 A ↑

a

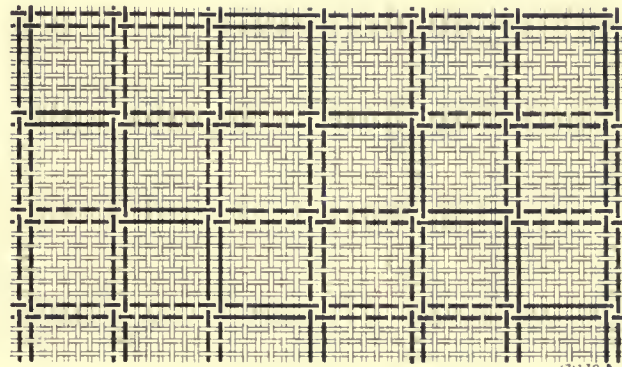


b

FLAT VIEWS OF PATTERN WEAVES

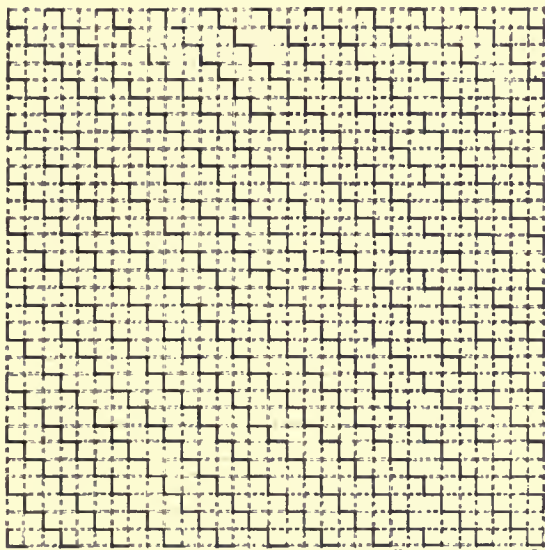


FLAT VIEWS OF PATTERN WEAVES



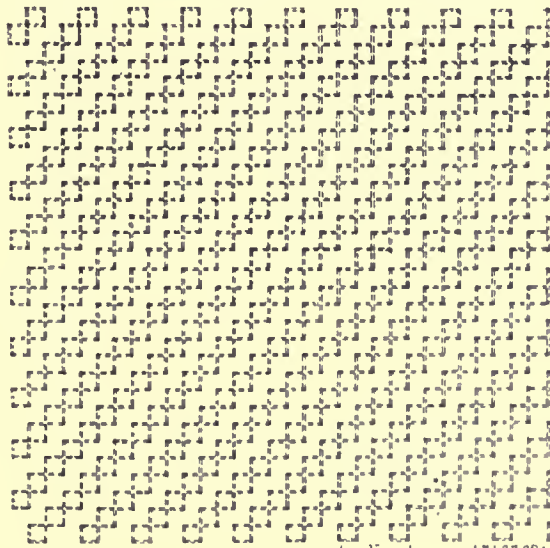
a, surface

171279 b



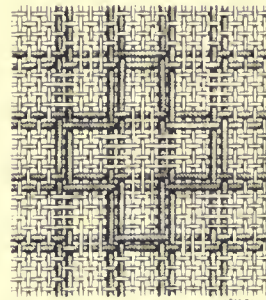
b, surface

171279 B



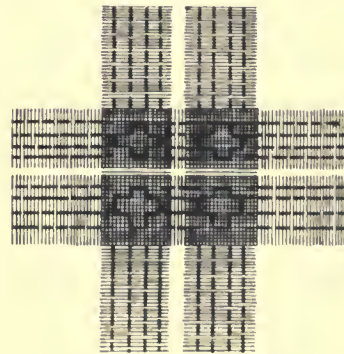
c, reverse

171279B



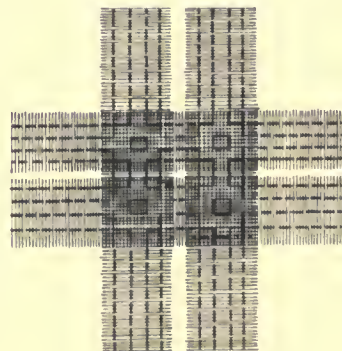
d

171280



e, surface

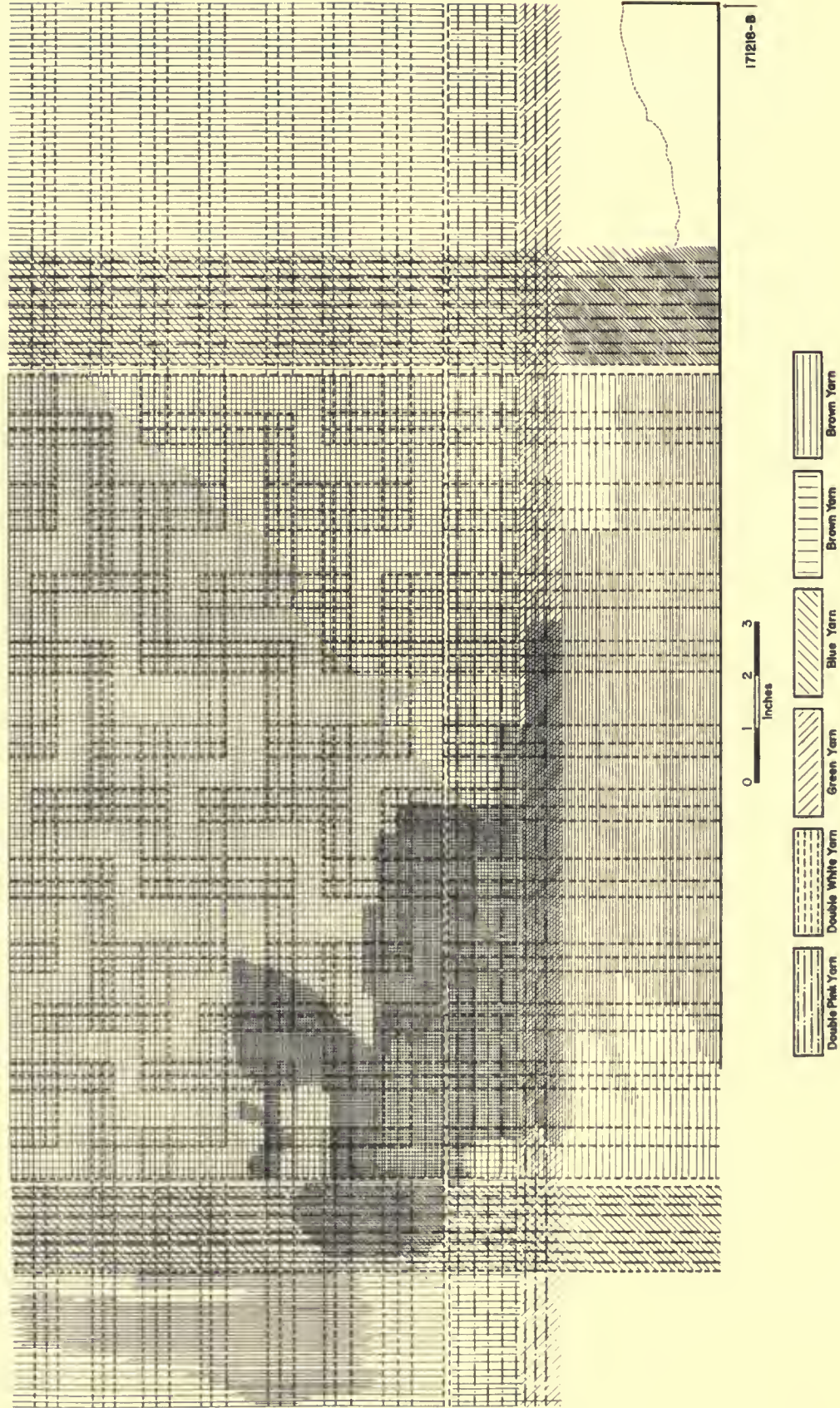
171236



f, reverse

171236

FLAT VIEWS OF PATTERN WEAVES



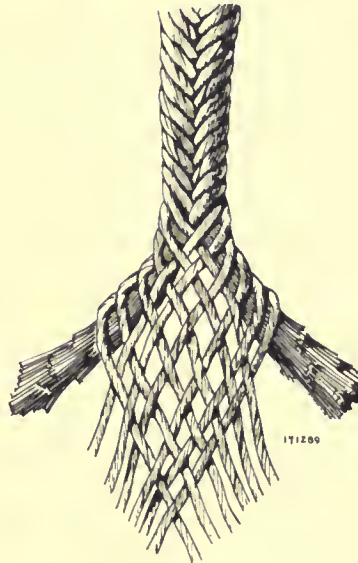
FLAT VIEW OF A PATTERN WEAVE



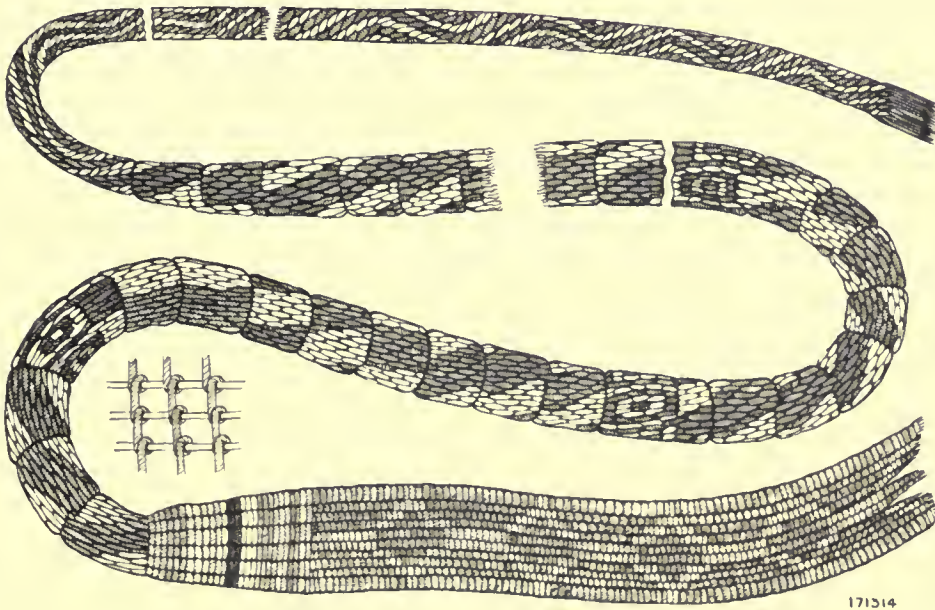
a



b

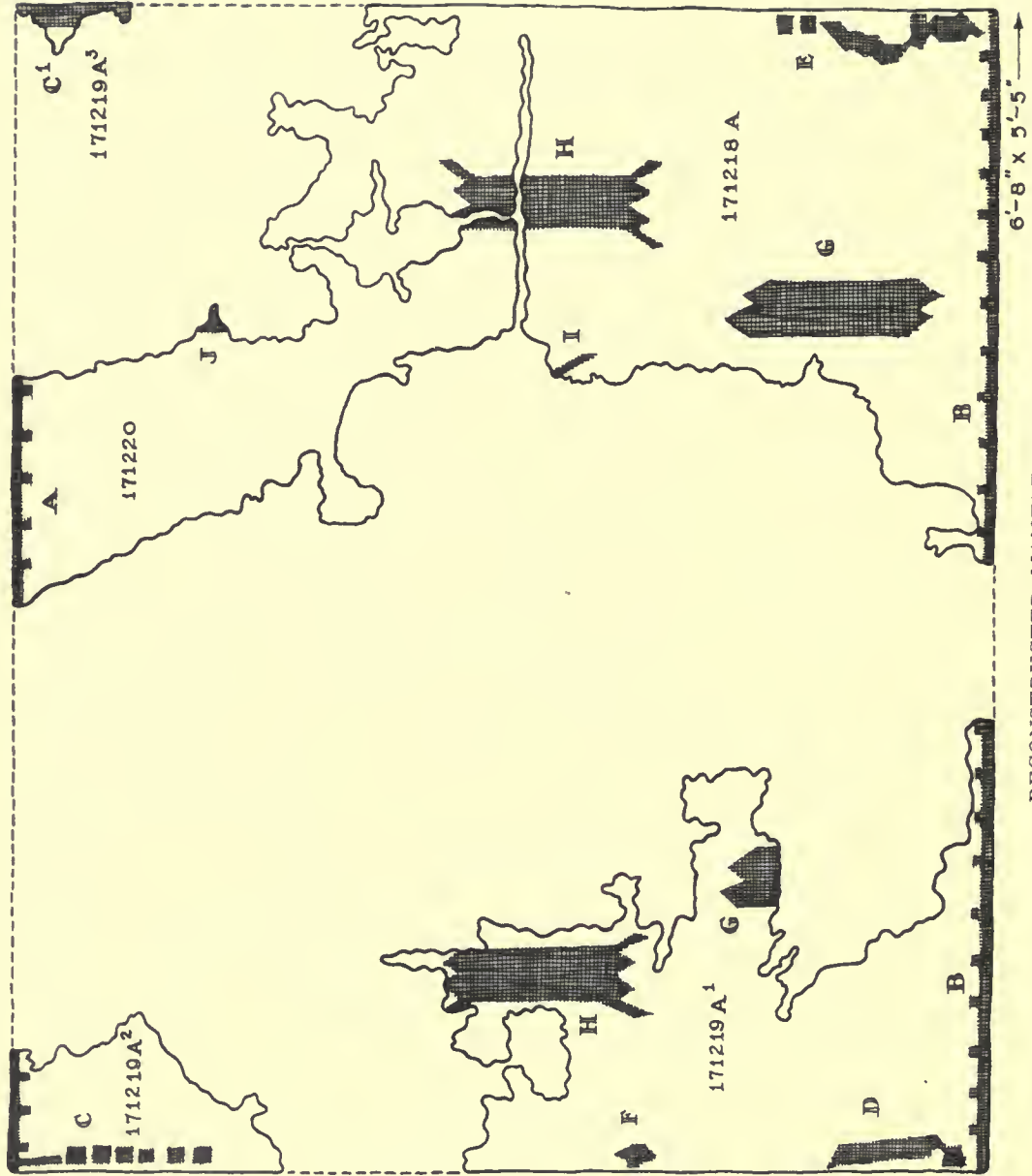


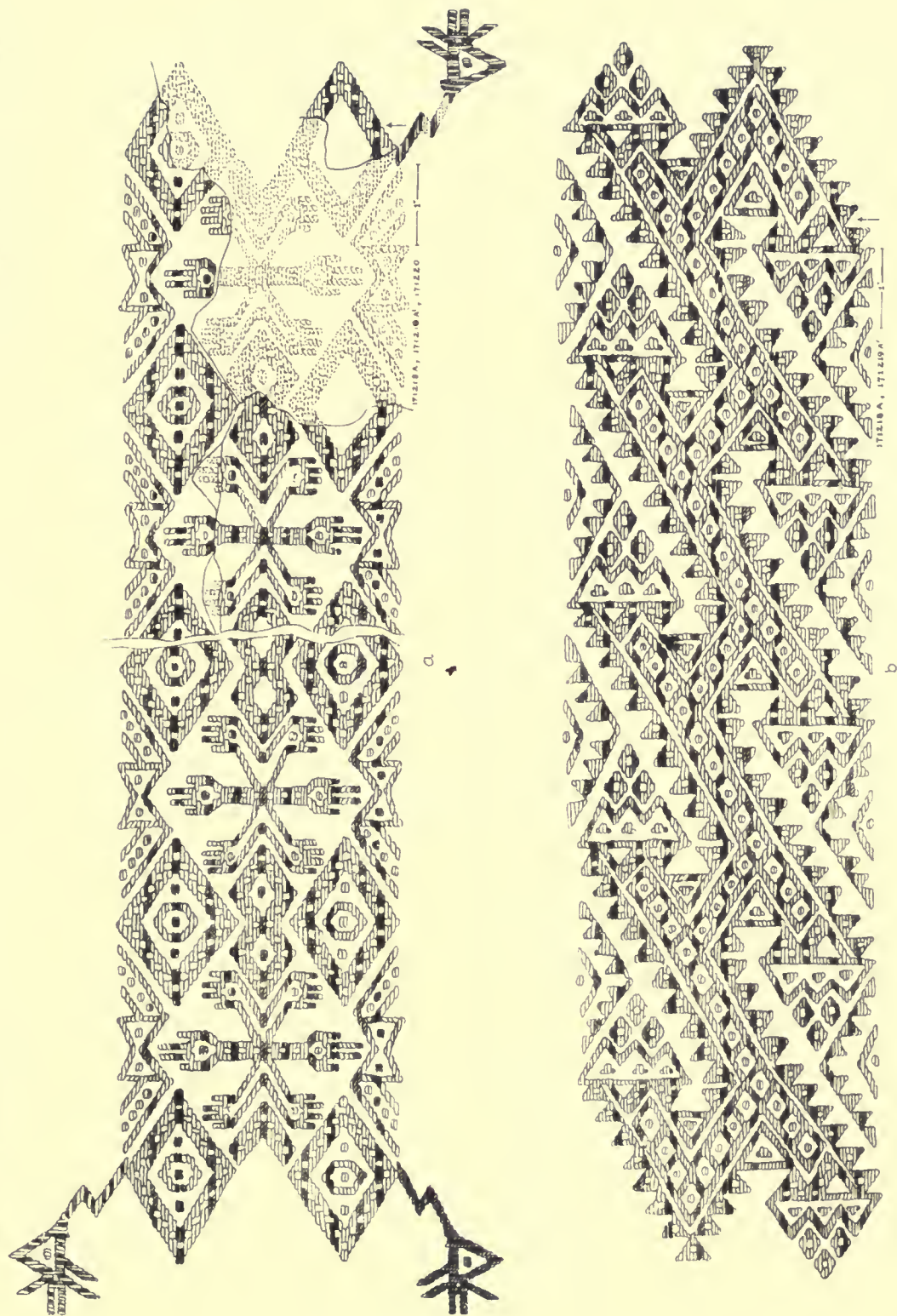
c



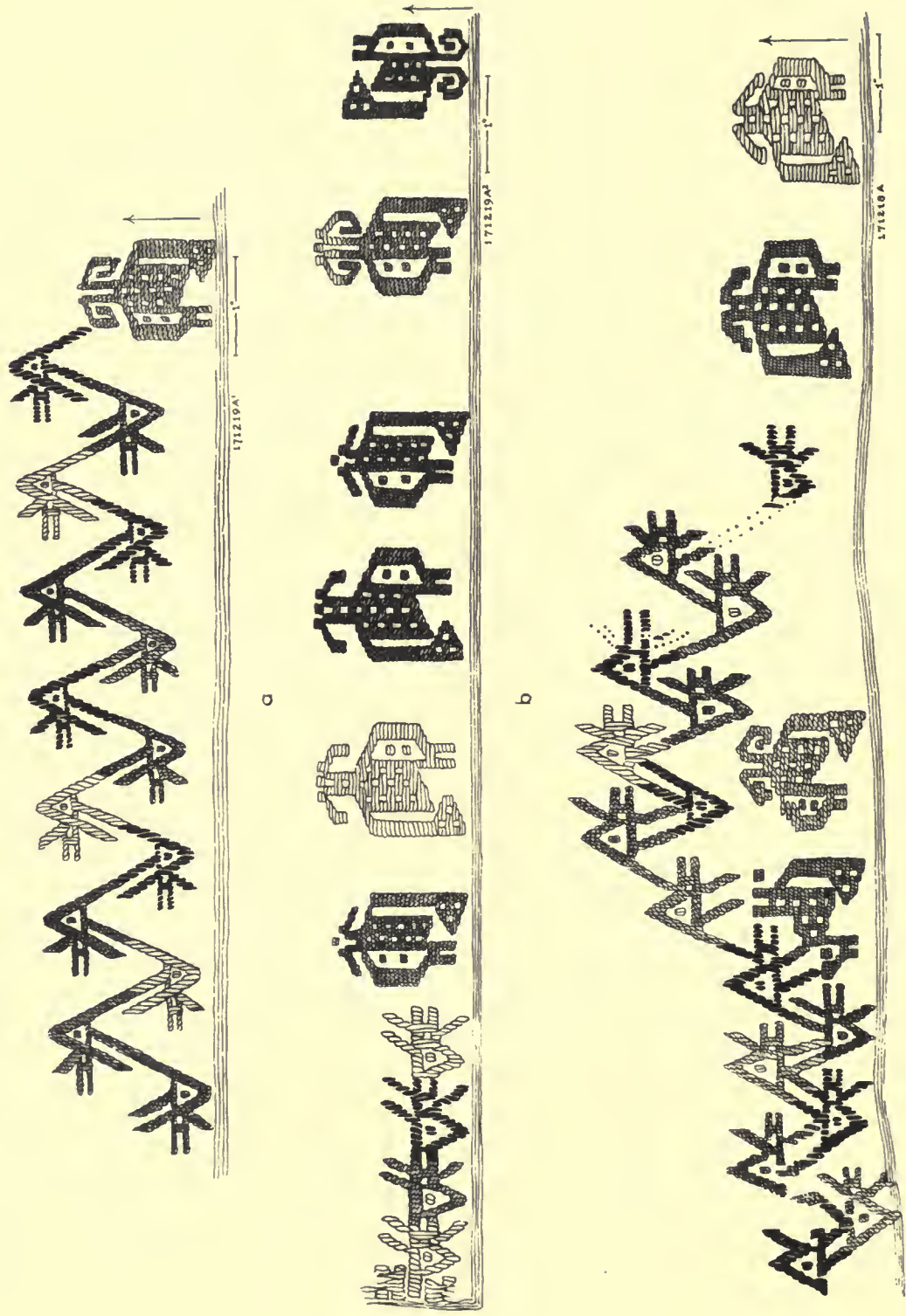
d

SLINGS AND SLING DETAILS

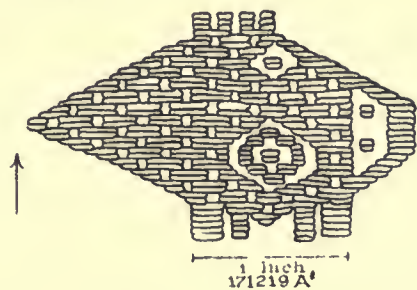




BROCADED MOTIVES IN MANTLE 171220



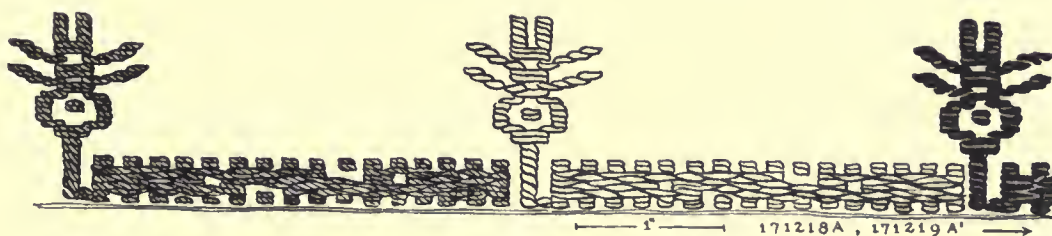
BORDER MOTIVES IN MANTLE 171220



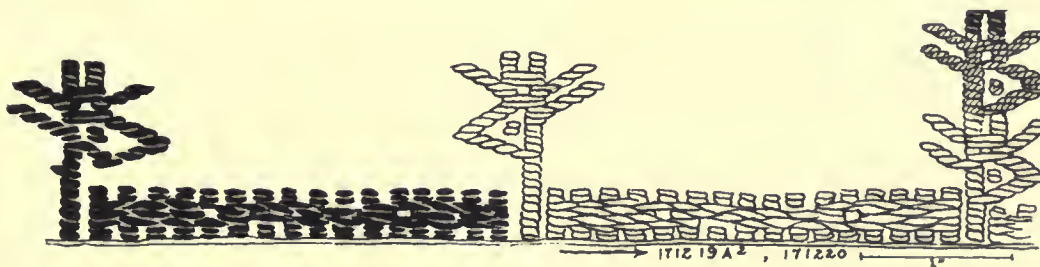
a



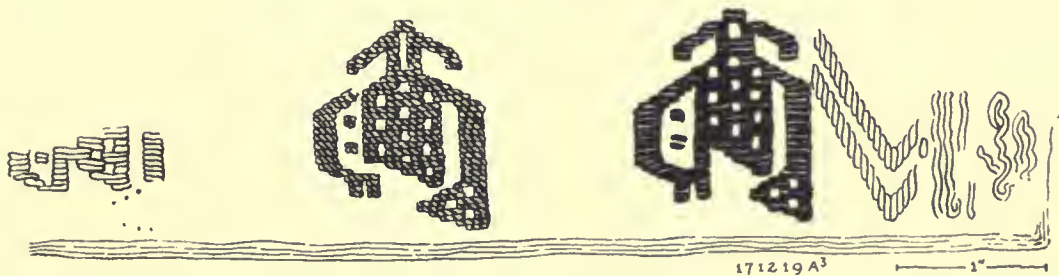
b



c



d



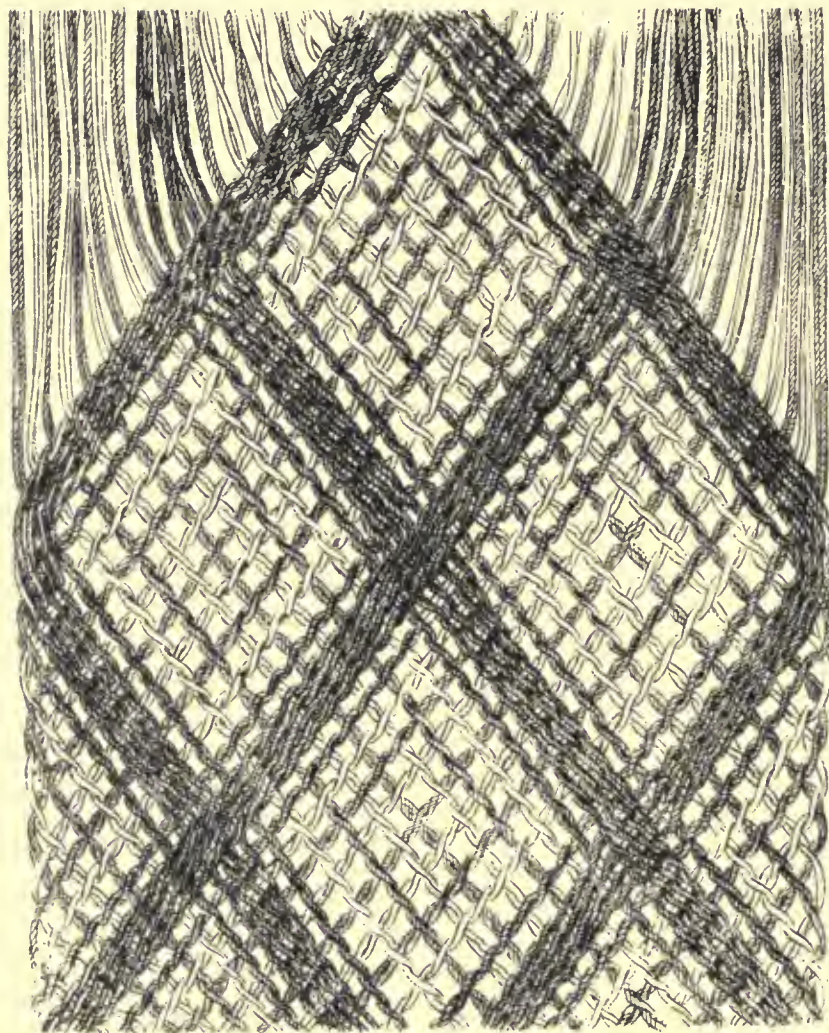
e

BORDER MOTIVES IN MANTLE 171220



170476 c

a



170476 c

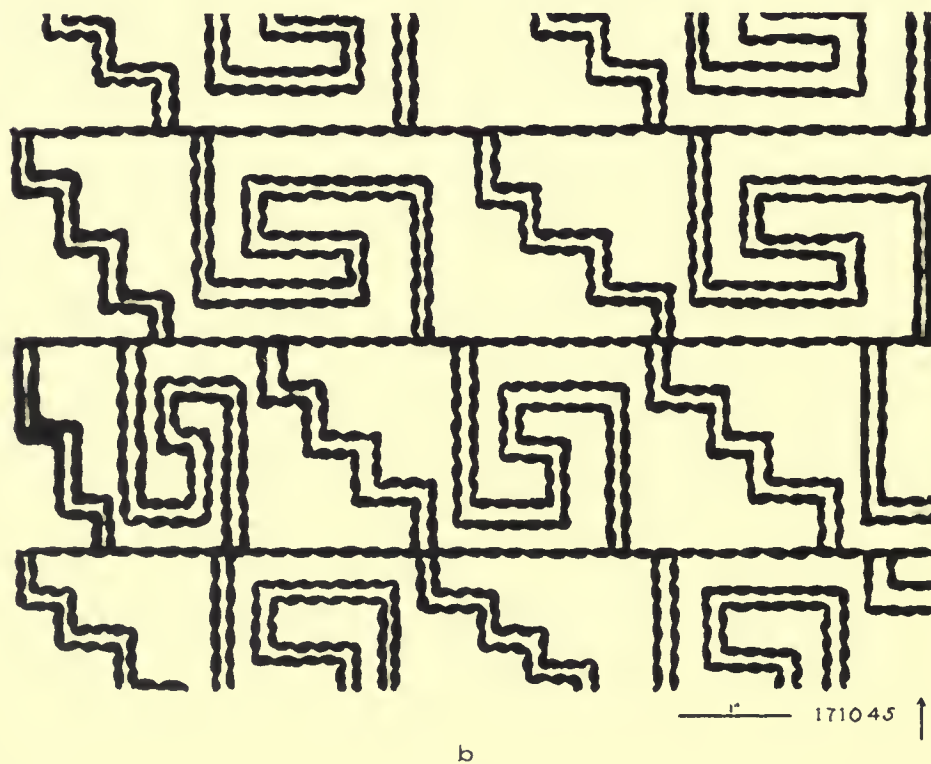
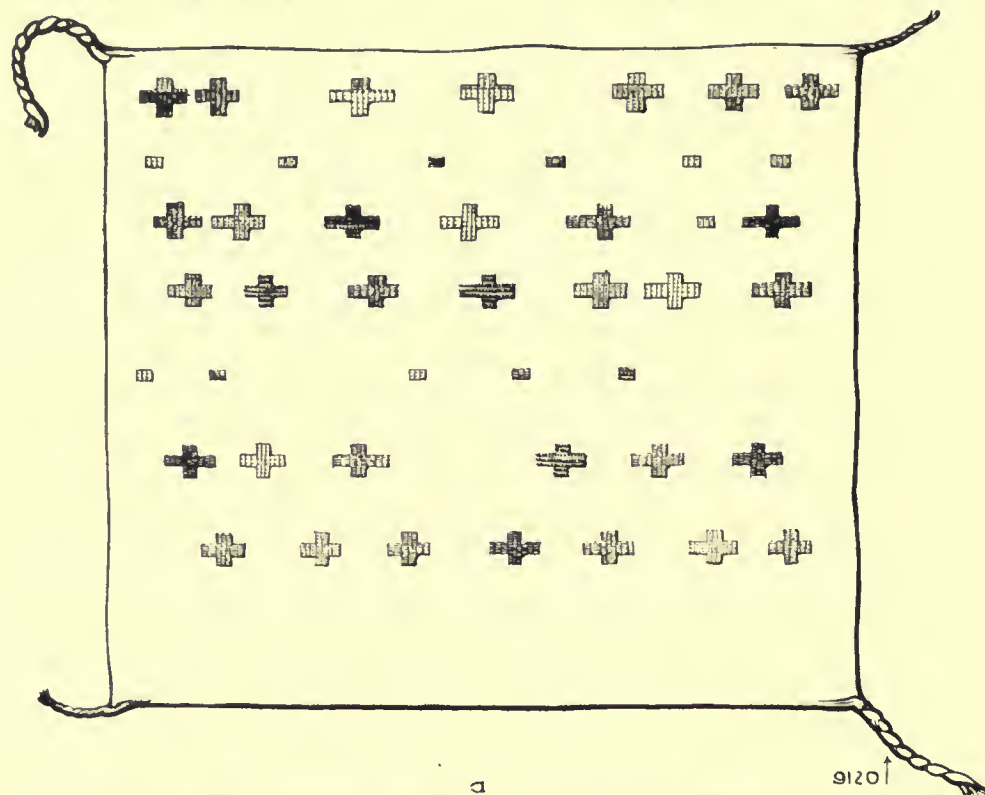
b

TWINE-PLAITED BANDS

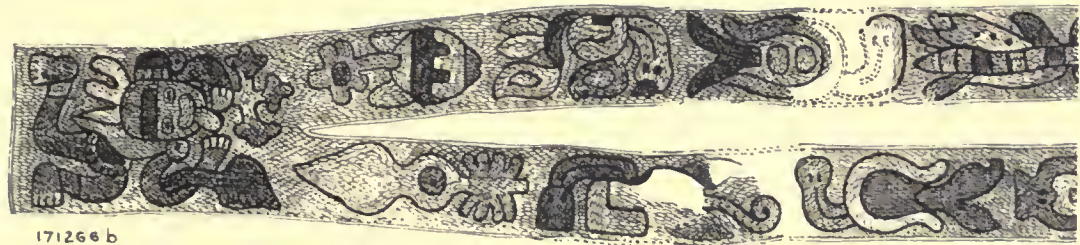


TWINED "LACE"

— 4-8537 ↑



EMBROIDERED KERCHIEFS



171266 b

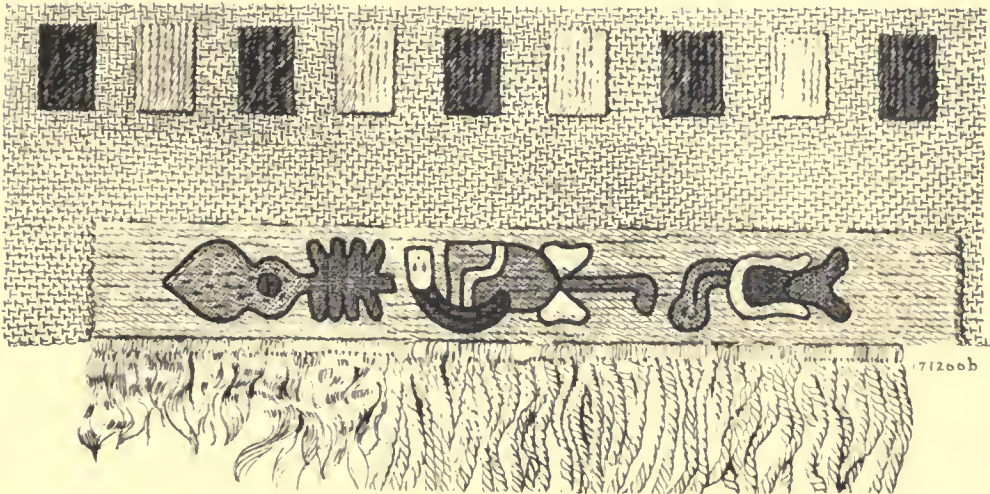


171266 b

a



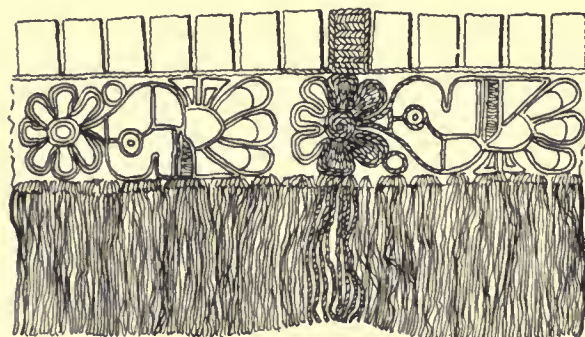
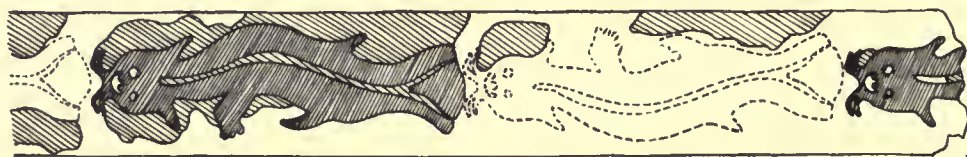
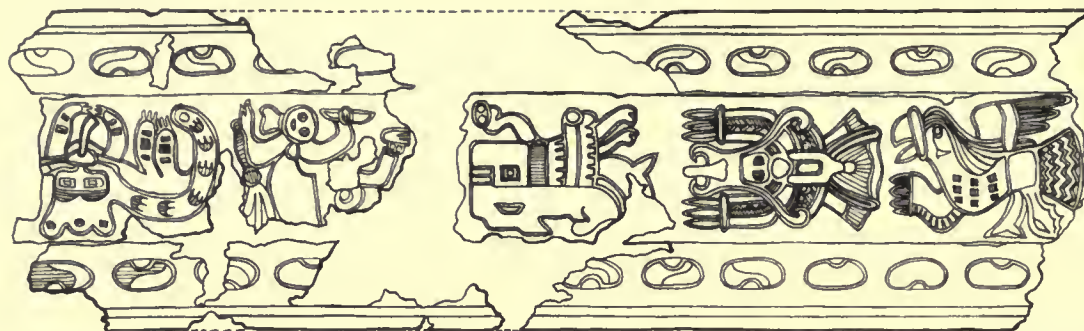
b



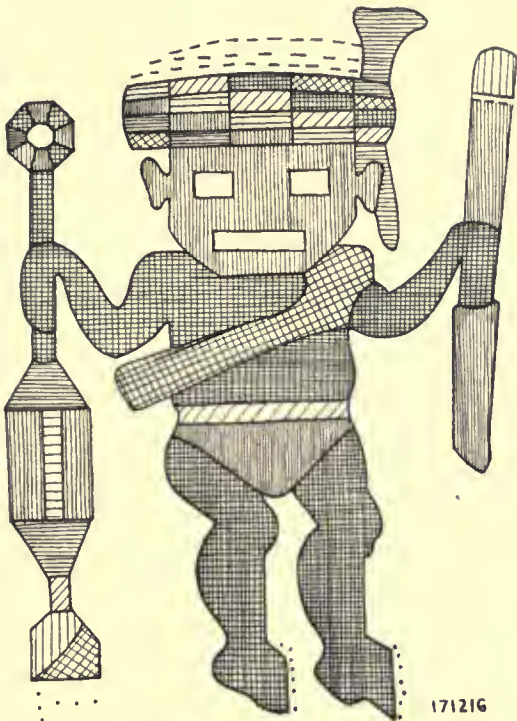
171266 b

c

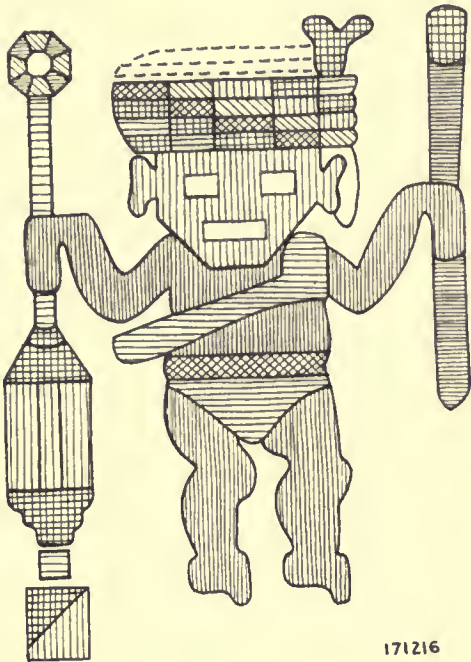
EMBROIDERED TUNIC BANDS



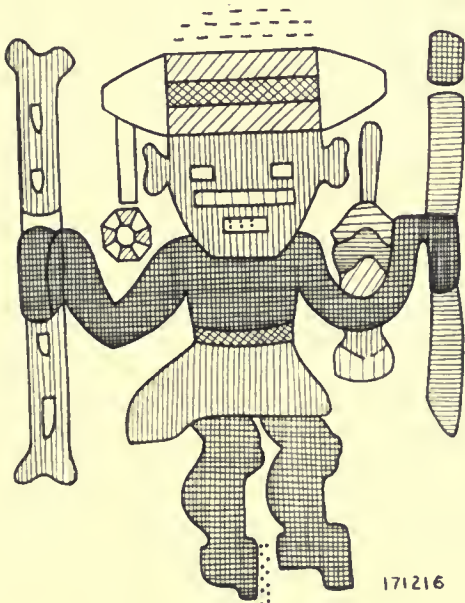
EMBROIDERED BANDS



a



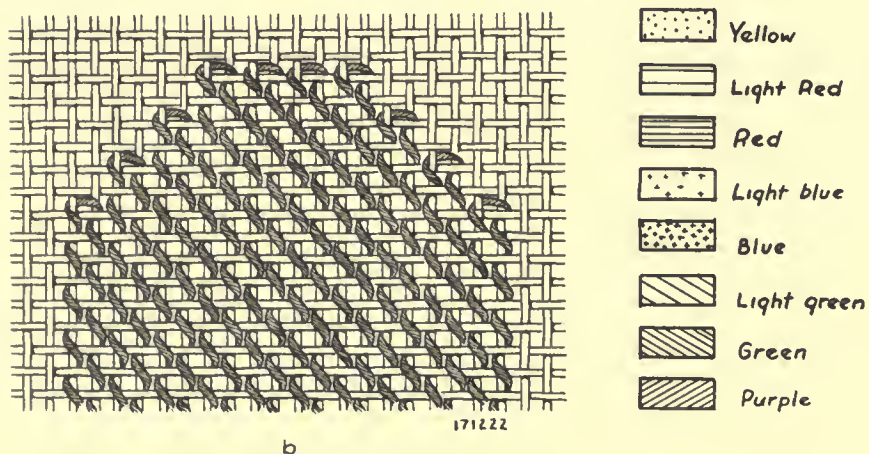
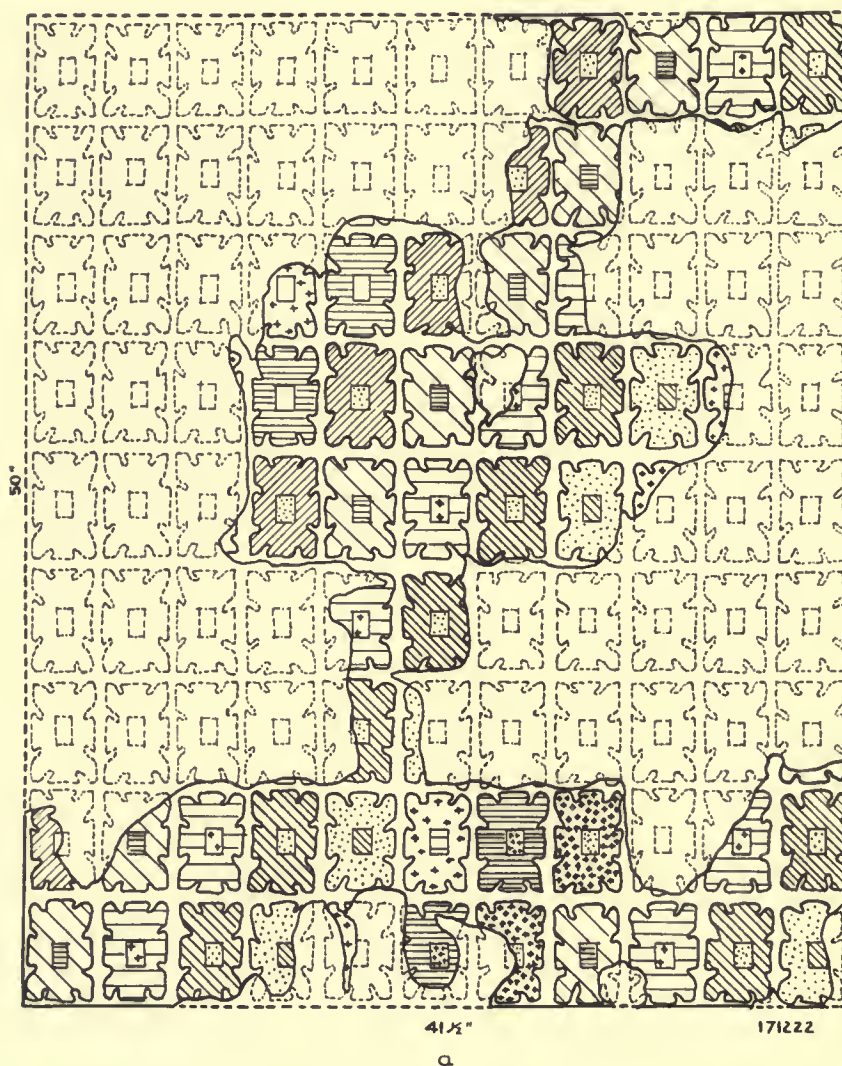
b



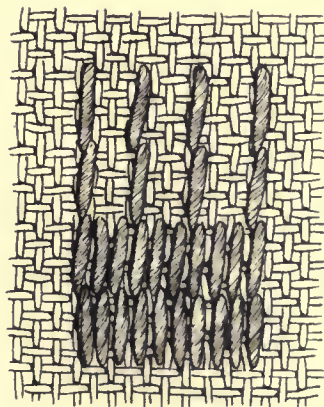
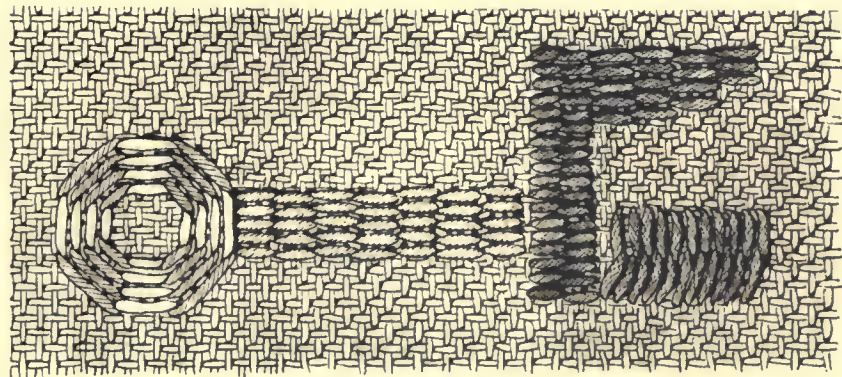
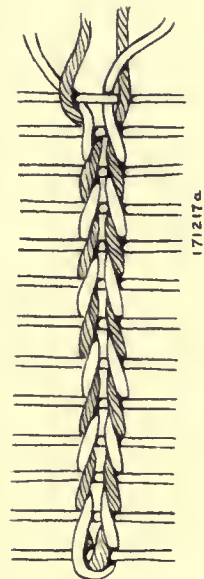
c



d



EMBROIDERED MANTLE 171222



b



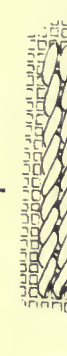
d



e

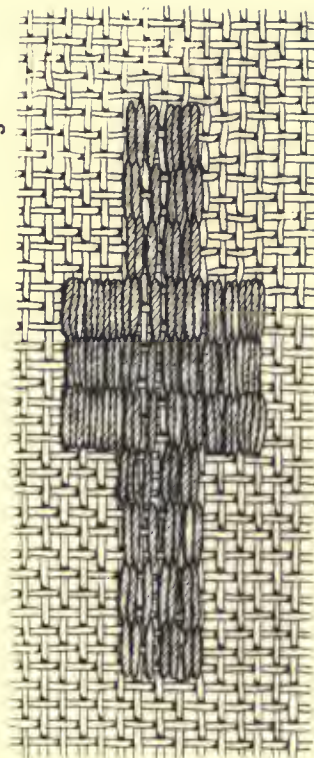


f



g

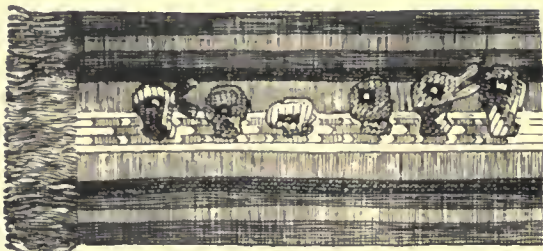
c



h

i

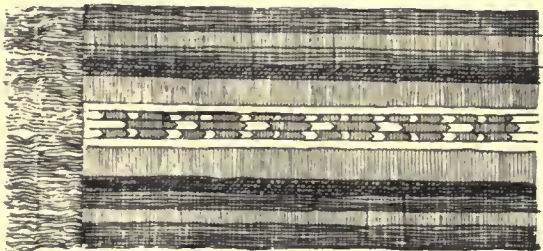
EMBROIDERY TECHNIQUES



171224~surface



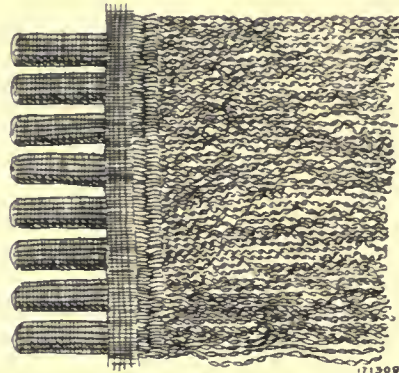
171224~profile
b



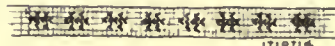
171224~reverse
c



f



d



171076



171007

g



h

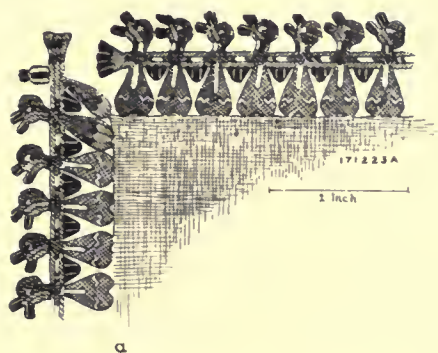


i

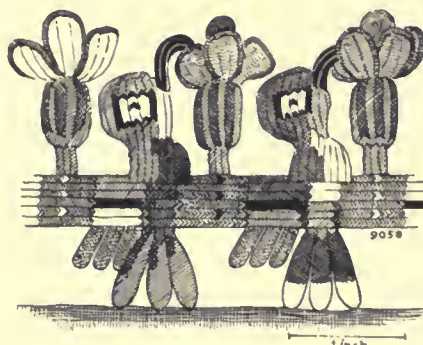


j

NEEDLEKNITTED BANDS AND FRINGES



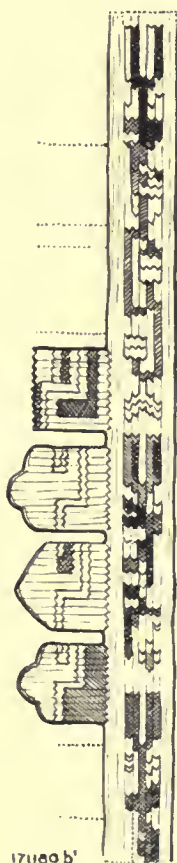
a



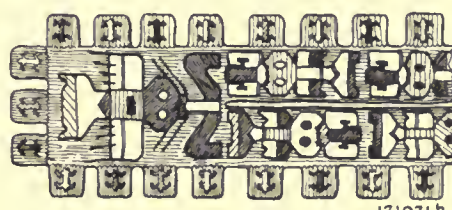
b



c



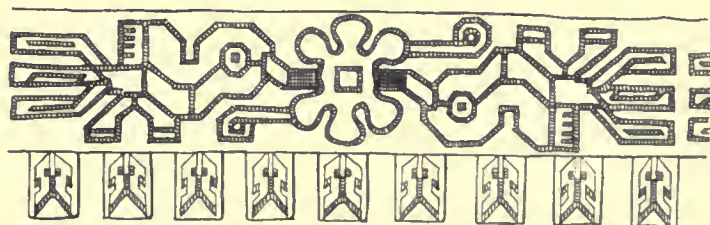
g



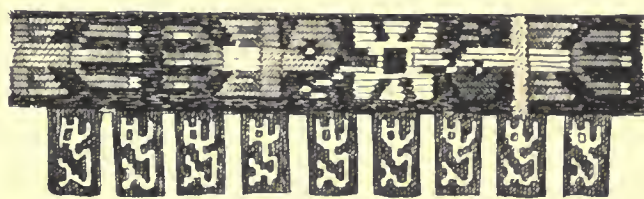
d



e

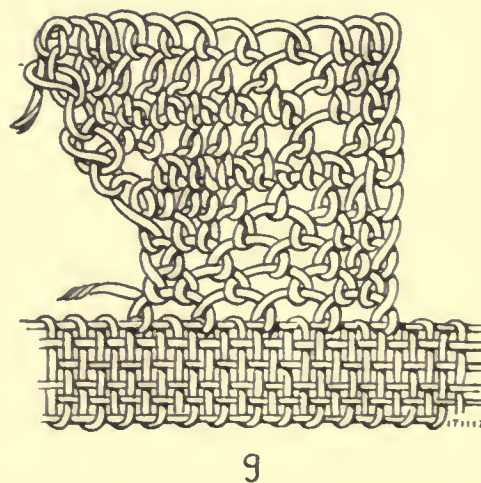
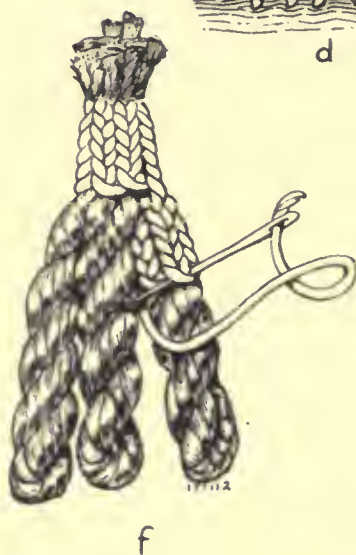
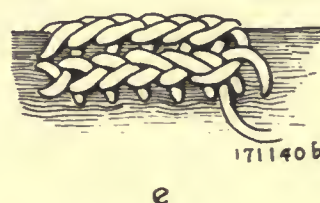
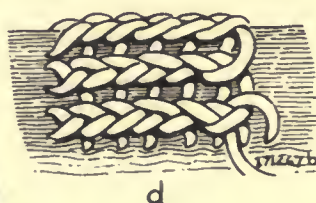
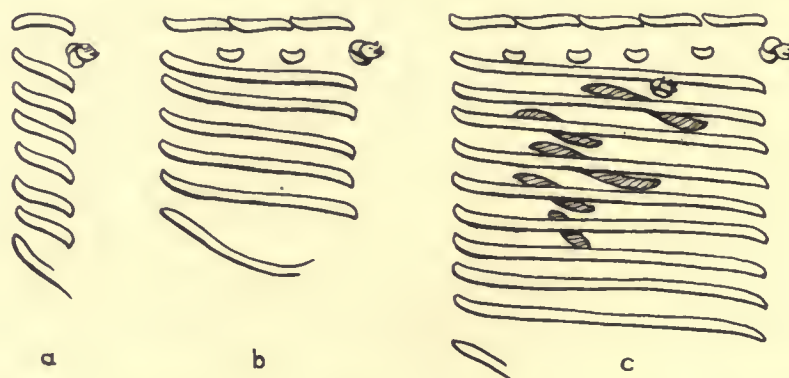
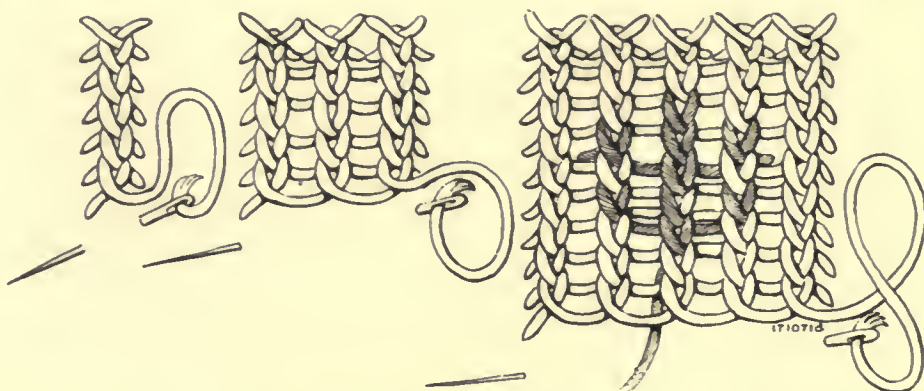


f

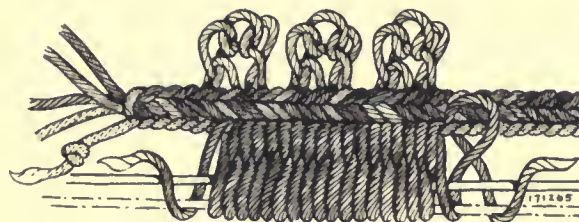


h

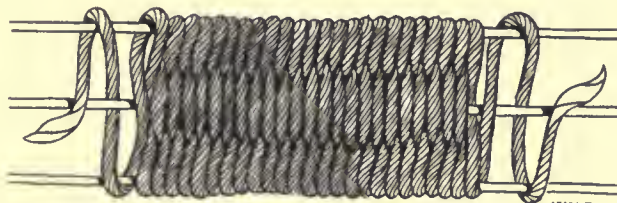
NEEDLEKNITTED BANDS AND FRINGES



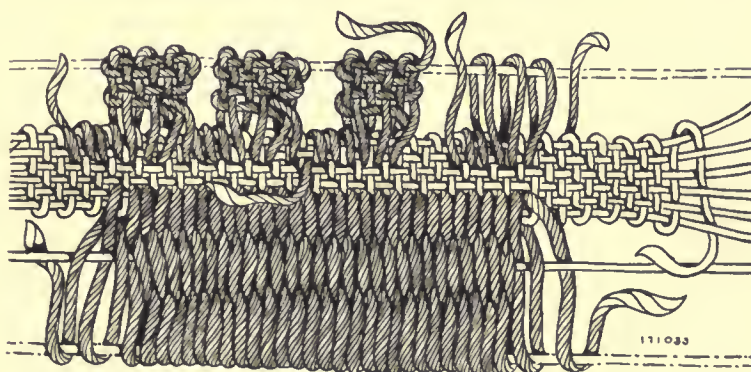
NEEDLEKNITTING TECHNIQUES



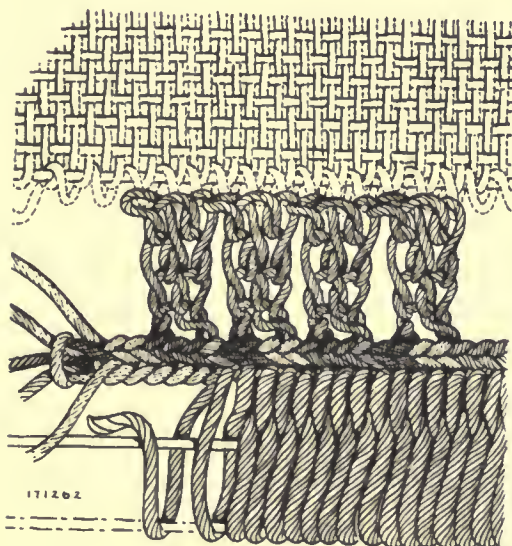
a



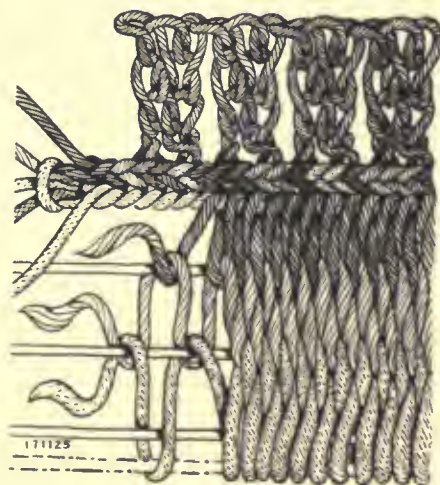
b



c

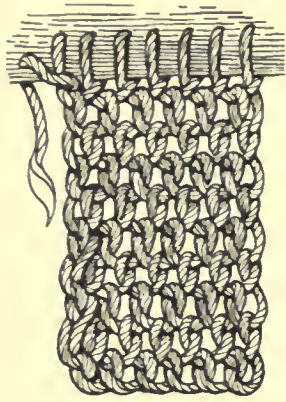


d

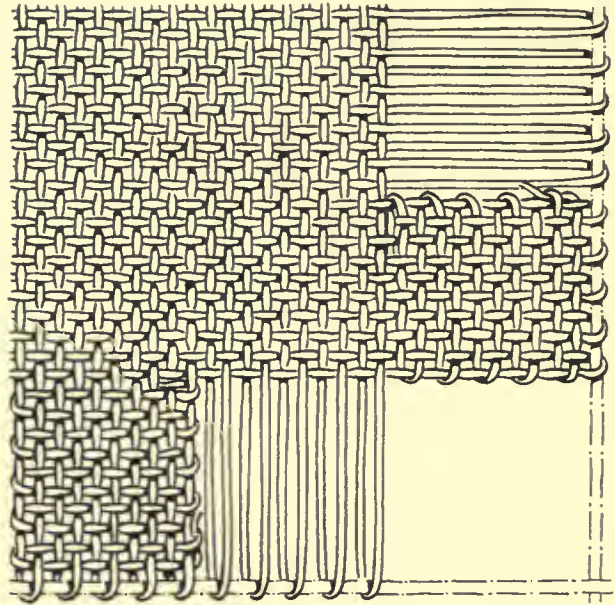


e

EDGE CORDS, TABBED AND FRINGED



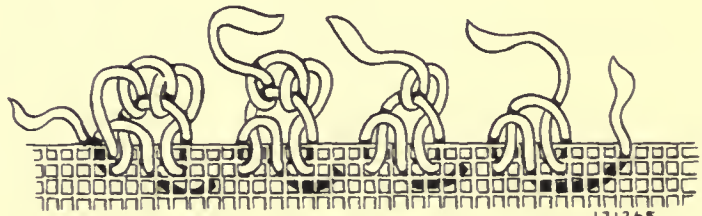
171180d



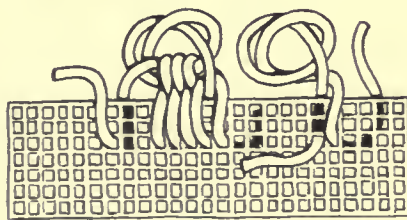
171140b¹⁻²



170476p²



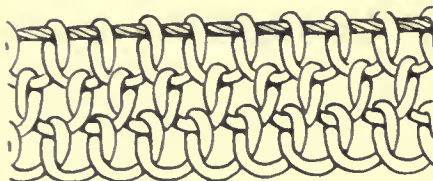
171265



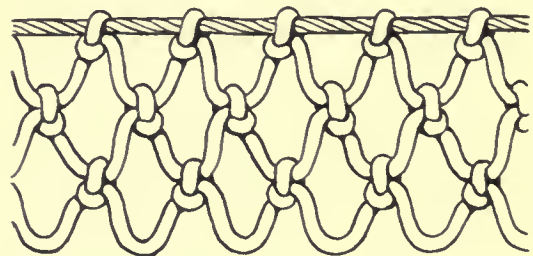
171045



171045

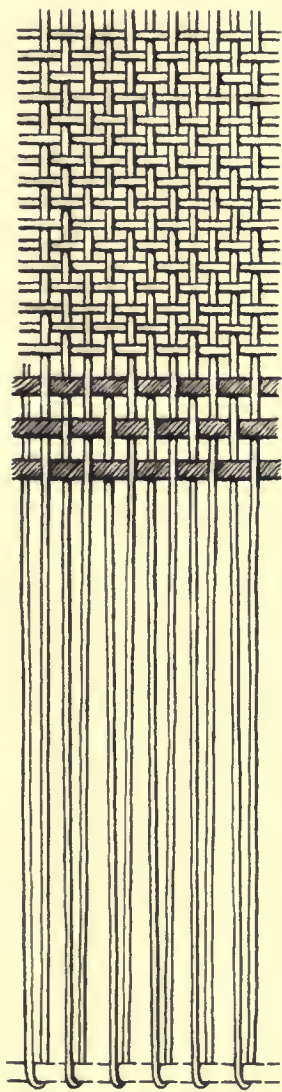


171118g



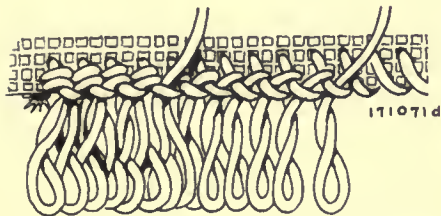
171118h

MISCELLANEOUS TECHNIQUES



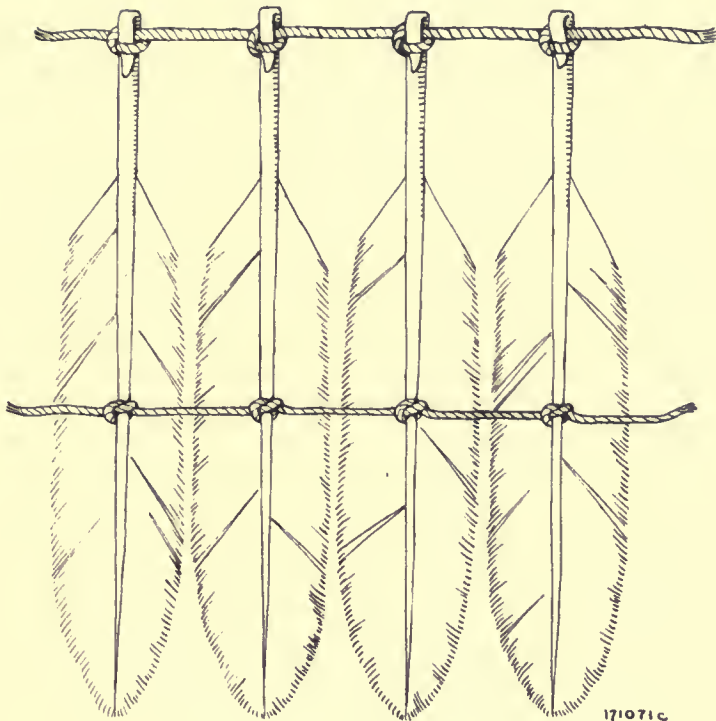
171266 b

a



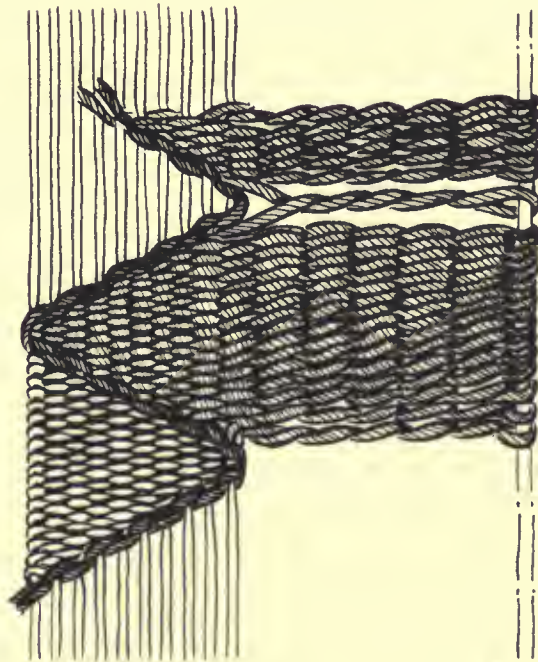
171071 d

c



171071 c

b



171508

d

FRINGE TECHNIQUES



a



b



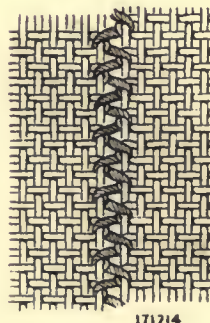
c



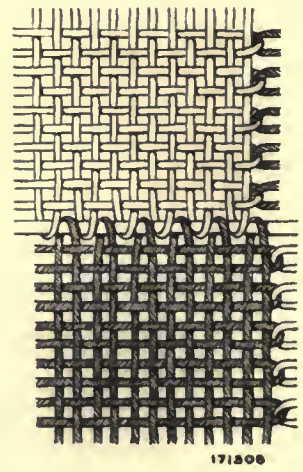
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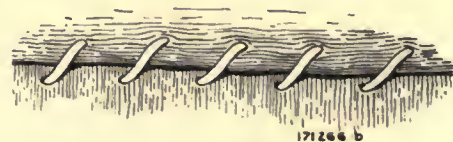
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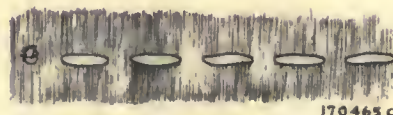
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g



h

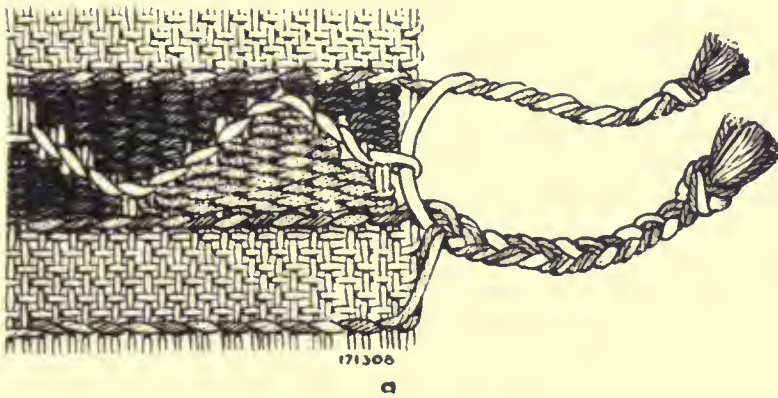


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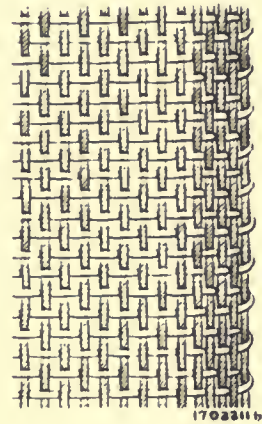


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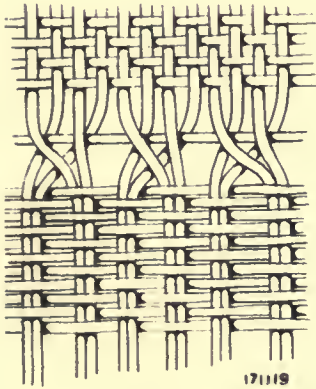
SEAMING STITCHERY TECHNIQUES



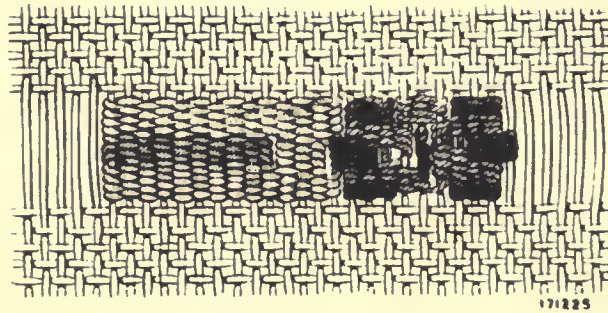
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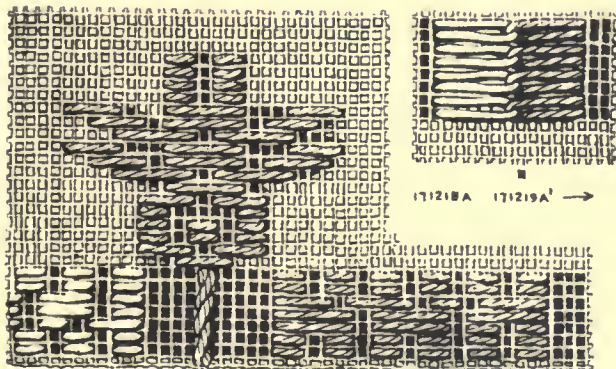
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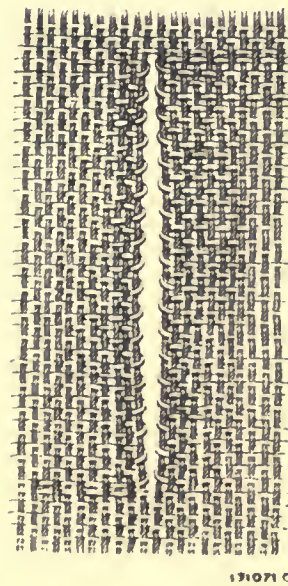
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d



f



g

